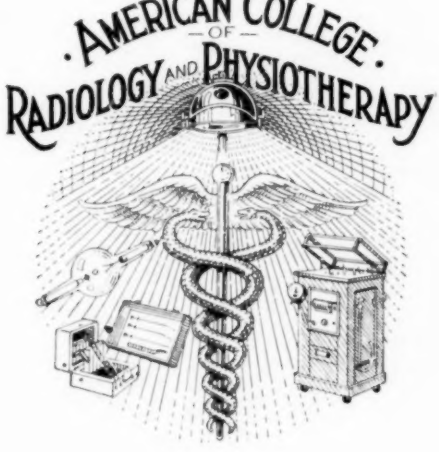
MAR 7 1925 Medical Lib.
89

THE JOURNAL OF RADIOLOGY

Vol. VI FEBRUARY, 1925 No. 2



PUBLISHED MONTHLY

AT OMAHA, NEBRASKA

The JOURNAL OF RADIOLOGY
Omaha, Nebraska
Vol. VI FEBRUARY, 1925 No. 2

Basis for Actinotherapy in Hay Fever and Asthma

ABRAHAM R. HOLLENDER, M. D., and
MAURICE H. COTTLE, M. D.,
Attending Otolaryngologists, American Hospital,
Chicago, Illinois.

ACTINOTHERAPY in hay fever and asthma is not altogether an innovation. It was used in European clinics nearly a decade ago. As its influence in ameliorating the distressing symptoms of bronchial asthma appeared to be sufficient indication for its employment, no scientific basis was offered at that time. Today, however, empirical therapy, regardless of its value, is not looked upon with much favor, and since the application of ultraviolet rays in hay fever and asthma, could not claim more than reasonable empirical value, the medical profession has rightfully regarded it with skepticism.

But the actinic ray has a definite place in the treatment of hay fever and asthma, and, what is more, there is in these diseases a definite indication for its use. Investigations during the past few years have demonstrated that much that has heretofore not been known concerning the etiology of hay fever and asthma is to be found in their blood chemistry. These studies involved the various chemical constituents of the blood, calcium in particular.

CALCIUM DEFICIENCY IN HAY FEVER AND ASTHMA

Hay fever and asthma may be classified as calcium deficiency diseases because the blood calcium content was found to be substandard. The calcium content of the blood serum was measured in a variety of pathologic conditions by Halverson, Mohler and Bergeim, in 1917. These writers did not, however, include in their work the diseases of the upper respiratory tract, and it was not until 1923 that Novak and Hollender reported in the *Journal of the American Medical Association* that a calcium deficiency actually existed in practically all cases of hyperesthetic rhinitis, or perennial hay fever, and in a large percentage of cases of seasonal hay fever and true bronchial asthma.

This work was based on the measurement of the calcium content of the blood serum in a series of cases which now has been extended by the present authors to a sufficient number to lead to three important deductions:

1. Hypocalcemia is most pronounced in the perennial type of hay fever (hyperesthetic or vasomotor rhinitis).

2. The amount of calcium deficit is in no way indicative of the severity of the symptoms, the blood calcium standard being an individual phenomenon rather than an arbitrarily accepted figure.

3. Contributory etiologic factors are of much importance and must be duly considered, such as visible and obscure septic foci, anatomic and physiologic nasal defects, notably arrested ethmoid development, climate and altitude, and occupations.

PERENNIAL HAY FEVER

There are few diseases in the field of medicine which have been so unsatisfactory from the standpoint of treatment as perennial hay fever (frequently called hyperesthetic or vasomotor rhinitis). Various operative and non-operative measures have been of little avail, and patients in despair have reconciled them-

*Read at the third annual meeting of the American College of Radiology and Physiotherapy, Chicago, Nov. 14, 1924.

selves to the fact that no relief or cure for their malady existed.

The problem which presented itself with reference to this disease was not so much that of pathologic cure as of symptomatic relief, for if the latter only could be offered, many patients would be made happy. Symptomatic relief was afforded at first by the administration of a calcium salt. However, this relief was only transitory and indicated that some other vital factors must be considered if the treatment was to be of value. This at once led to a study of calcium metabolism in general.

The basal metabolic rate was measured in a series of cases of hyperesthetic rhinitis by Novak in 1921. Perkins, in the same year, found that his series of asthma cases yielded an increased basal metabolism. In 1922, Simpson also investigated the basal metabolism in hyperesthetic rhinitis and asthma, and reported an exceedingly small number of cases showing a low metabolic index. Beck, in a recent discussion of this problem, said that his results were low in most instances. While a lack of uniformity of results are on record, we are convinced from our own data that the hyperesthetic diseases yield a low metabolic index in the majority of patients.

On the basis of his experimentation, Novak gave his patients with hyperesthetic rhinitis thyroid extract and found that much relief was afforded for a considerable period of time—in some instances, permanently. This suggested that the calcium deficiency was based on a disturbed calcium metabolism, governed, in all probability, by the endocrines.

SEASONAL HAY FEVER

Calcium and thyroid therapy in seasonal hay fever did not bring about such consistent and favorable results as those which were obtained in the perennial type of the disease. In the latter, no local (nasal) treatment was found necessary at any time. It was quite evident, however, why seasonal hay fever should not respond readily. The calcium deficiency is not so marked, nor is it so uniformly subnormal. Furthermore, there are other factors that contribute to the etiology. More important among these are nasal defects, anatomic and physiologic in character, and, associated with the entire picture, a toxemic state with an apparent or obscure septic focus.

BRONCHIAL ASTHMA

In asthma, the blood calcium content is low in more than 50 per cent of the cases, and in a certain number of those in whom the blood calcium content is not much below the accepted standard of 10.5 mg. per hundred cubic centimeters of blood serum, the calcium and endocrine therapy, combined with other rational procedures indicated by the contributory etiology, is equally as productive of favorable results as in those subjects who showed markedly low blood calcium contents.

One must conclude, therefore, that the assumption of an arbitrary figure as a calcium standard is a decided error—if not in other calcium deficiency diseases—certainly in seasonal hay fever and asthma. The blood calcium standard is an individual phenomenon, dependent upon the individual's body resources. It is irrational to preclude that state of health, diet regimen, personal hygiene and environment have not an influencing course on the required content of blood calcium necessary to maintain a body free from disease, or at least certain diseases. While 10.5 mg. per cent may be considered normal, it does not follow that this figure is always standard, and this belief is further confirmed by our investigations in hay fever and asthma. The question then arises as to what is normal for the individual case. This is best answered when therapy fails.

TABULATED REPORTS

The following gives, in as concise a form as possible, the laboratory results obtained in a series of cases. Acknowledgement is made to those physicians who were kind enough to send their findings to us so that they could be used with ours for this tabulation:

METHODS OF MEASURING BLOOD CALCIUM CONTENT

Several different methods for the determination of the blood calcium content are known. In 1921, Kramer and Tisdall suggested a simple technique which requires only small amounts of serum, and in the same year submitted still another method by means of which determinations could be made with serum or plasma.

Still another technique was published in 1917 by Halverson and Bergeim. Clark recently gave out the plan which he employs, and while it possesses many good features,

CALCIUM DETERMINATIONS OBTAINED IN A SERIES OF CASES OF PERENNIAL AND SEASONAL HAY FEVER AND ASTHMA

	Number of Cases	Lowest Calcium Finding	Highest Calcium Finding	Average for Total Cases
Perennial Hay Fever (Hyperesthetic or Vasomotor Rhinitis)	94	6.76*	10.2**	8.6
Seasonal Hay Fever (Spring and Fall Types)	142	8.7	11.2	10.47
Bronchial Asthma	48	8.7	10.5	9.8

*Mgms. per hundred c.c. blood serum.

**Accepted standard for certain calcium deficiency diseases such as rickets and tetany is 10.5 mgms. per hundred c.c. serum.

and undoubtedly is accurate, it is more time consuming than some of the other procedures. More recently, Oltramare described his method of estimating the calcium content of the blood. In the main, however, Oltramare's technique differs little from that in common use.

Blood calcium determination involves several factors:

1. The preparation of a solution containing all of the calcium but free from interfering organic matter is necessary.

2. Precipitation of the calcium is accomplished in the presence of such other elements as commonly occur.

3. Accurate estimation is made of the precipitated calcium. The calcium is precipitated as oxalate directly in the filtrate from biologic fluids after the removal of proteins, the final estimation being carried out by a refinement of the permanganate titration method. This, of course, determines only the diffusible calcium.

ANATOMIC AND PHYSIOLOGIC NASAL DEFECTS

In a consideration of the contributory etiologic factors, the nasal membrane of hay fever and asthmatic subjects presents much that is of interest from a physiologic standpoint. This phase undoubtedly has to do with the permeability of the membrane involving the phenomenon of osmosis. Normally a nasal membrane should not be hypersensitive. When it is, function is disturbed, owing, in all probability, to metabolic changes in the whole organism. The function may, however, be restored by constitutional alteration, aided and hastened by local agencies. The best proof from a clinical standpoint regarding the increased permeability of a hypersensitive membrane is the rapidity with which it absorbs medication as compared with a normal nasal mucosa.

It would seem that the tonicity of the nasal secretions also presents some influencing factors. Chemically the secretions vary little in hay fever subjects. The fact that these secretions are watery and rich in chlorids suggests the possibility of poor or defective chlorid retention; or perhaps there is an excess in chlorids, and nature makes an effort to cast off the surplus by increased excretory function. This may be accounted for by a metabolic error, controlled, in part at least, by the endocrines. It is reasonable to assume, however, that the control of nasal secretion, so far as hay fever is concerned, is based on disturbances of the endocrine glands. This is evidenced clinically by the favorable effects obtained in regulating the function of the nasal membrane by glandular therapy.

Anatomic defects are well recognized contributory causes. Few physicians, and particularly rhinologists, are unable to tell of absolute cures in hay fever and asthma subjects by nasal operations unaided by other therapy. The report of Maxwell H. Kaiden, a short time ago, emphasized the importance with which one must regard nasal obstruction as a factor in hay fever. Adherents of the pollen treatment of hay fever, in attempting to account for indifferent results, point out that the upper air passages of sensitive persons merit the attention of the specialist. If mechanical obstruction or deformity exist, surgical measures should be employed to correct them.

Nevertheless, we analyzed a report by Lintz, who stated that, in his study of 300 cases of asthma and other forms of allergy, 30.4 per cent of the patients had been operated on, yet not a single one was cured by any of these operations. Nose and throat operations were most frequently employed. Lintz was firm in his belief that the benefit derived from these procedures is neglible and that they

should be abandoned in the treatment of asthma and hay fever.

Thus a diversity of opinions has been expressed regarding the anatomic nasal defects. The consensus of opinion points to the merit of operative procedure when definitely indicated. One cannot be dogmatic in concluding from the results and observations of the minority that correction of nasal defects is not of material benefit, nor can one neglect to realize that in a good majority of hay fever patients there are definite operative indications.

INFLUENCE OF SYSTEMIC FACTOR

Although the systemic dyscrasia in hay fever and asthma was long ago recognized, it has received little attention of late because of the many new theories which have been advanced. A calcium deficiency disease is usually attended by a state of toxemia, and this is precisely what is true in hay fever and asthma. It is for this reason that general detoxication plus eradication of the septic focus is an essential factor in the treatment. However, detoxication to be effective must be supported by calcium and endocrine therapy.

In this connection the problem of diagnosis is important because the rhinologist alone is unqualified to determine the septic focus if it is elsewhere than in the head. The conjoined study with the internist, the roentgenologist and the dental surgeon will frequently lead to the localization of factors which have a distinct etiologic significance. As an illustration one need only mention a condition such as colonic stasis, for no single irregularity in the human organism is more capable of producing a stubborn state of toxemia. There may also be other latent foci which must be properly investigated.

FOCAL INFECTION

Focal infection, with special reference to teeth, tonsils, adenoids, sinuses, etc., has been stressed in earlier communications because we were always cognizant of their deleterious effects. Owing to their influence in retarding the successful progress of a patient, it is indeed not improper to repeat this subject.

How frequently are we called upon to treat asthmatic patients who were not given the benefit of a thorough examination to determine whether some pathologic process in the upper respiratory tract is obstructing the possibility of a cure! No one will argue that, regardless of the efficiency of any method, it is usually valueless in the presence of an unattended pathologic condition anywhere in the body.

As a consequence, focal infection as a contributory cause in hay fever and asthma must have due consideration. Findings in the teeth, gums, nose and pharynx must be based on more than opinion or cursory examination. The roentgen ray reveals much that is latent and obscure, and the laboratory is a valuable and indispensable aid. In fact, every known recognized diagnostic procedure must be put into play, and when the final reports are examined, each result should be carefully weighed as an influencing factor.

ENDOCRINE ASPECTS OF HAY FEVER AND ASTHMA

The effects of calcium therapy in asthma and hay fever long ago suggested a deficiency of calcium in the system, but just how this deficit manifested itself was never definitely demonstrated. As a result of recent studies, successes with calcium therapy in hay fever and asthma were attributed to a blood calcium deficit. This at once led to the belief that a disturbed calcium metabolism existed, governed in all probability by the endocrines. This view was strengthened further when it was found that with the disturbed calcium metabolism a state of toxic absorption was present.

The problem which presented itself was the regulation of the blood calcium content, for only in this way could a disturbed calcium metabolism be properly balanced. From the endocrine standpoint, the parathyroids are the calcium regulators. It would appear, then, that parathyroid substance meets the situation at hand. The indication for thyroid or parathyroid substance in the deficiency diseases, especially with our knowledge and evidence of blood calcium deficit and its underlying toxemic state, resolves itself into the problem of equilibrium between the sympathetic and the parasympathetic systems, represented by the thyroid and parathyroid glands respectively. Any disturbance of this balance results in disease, depending on which of the systems has been affected.

This view is identical with the one voiced by H. W. C. Vines of Cambridge, in a report which was published only last year. Vines concluded: "The rationale of parathyroid therapy is therefore simple; it is a means of re-establishing the normal endocrine balance of the body, which infection has disturbed; adequate resistance to disease is not a function either of the sympathetic system or of the parasympathetic system, but of the equilibrium between them."

It is generally held that the parathyroids have two functions; they regulate calcium metabolism, and they are in some way able to prevent intoxication by guanidin and its derivatives. The influence of the parathyroids on calcium metabolism was best illustrated by the studies of Grove and Vines. They showed that calcium therapy in itself is insufficient to influence permanently the calcium in the blood serum, nor is it adequate to cause complete healing of the pathologic condition existing. While some favorable changes were noted when calcium was administered by the injection route, it was necessary to give, in addition, small doses of parathyroid substance by mouth. After this supplementary medication was instituted, complete healing resulted.

It may thus be understood that if a disturbed calcium metabolism is to be properly regulated, endocrine therapy must be called into play. It is on this basis that parathyroid substance is administered in hay fever and in asthma. However, owing to the inertness or inactivity of parathyroid substance as it is now marketed, thyroid extract is combined with it. The best results are obtained when thyroid, parathyroid and some salt of calcium are administered in suitable combination and dosage.

TREATMENT

In a discussion of treatment, prevention is the important phase. Perennial hay fever and asthma do not lend themselves well to preventive measures, although it is reasonable to assume that this form of treatment is ideally conducted during the interval when symptoms are least pronounced. Seasonal hay fever, however, must be handled on a prevention basis if the treatment is to be accepted as rational. No single method or combination of methods can be prescribed as being specific. It must be said that seasonal hay fever prophylaxis is an individual problem in which two important elements must be investigated: (1), The constitutional dyscrasia, and (2), focal infection, with special reference to the nose. The constitutional dyscrasia involves a study of the blood calcium content and detoxication. Focal infection includes in its scope the correction or removal of every form of nasal, dental, pharyngeal, gastro-intestinal or pelvic pathologic conditions.

In seasonal hay fever, the constitutional measures should be supplemented by desensitization of the nasal membranes. Although there are various ways by which this may be accomplished, two methods were found to be very satisfactory. One, the slower procedure, is argyrol tamponage. Cotton tampons saturated with a 10 per cent solution of argyrol are packed high in the nasal chambers and permitted to remain in place for a period of from thirty to forty-five minutes. This is repeated daily or every other day until the membrane is thoroughly desensitized. Just what other effects these argyrol tampons have, we are not going to discuss at this time, but we are certain that the action is both antiphlogistic and desensitizing. While this method is highly satisfactory, it is slow in its permanent effect, and therefore we have replaced it, in most instances, by medical diathermy and its complement modality, ultraviolet irradiation.

The technique for diathermy in the nose is not new. It is described by many authorities in their texts. The only modification which we suggest is that the applicator be kept in motion during active treatment, thereby constantly massaging the mucosa in every accessible part of the nose. We employ as strong a current as the patient can tolerate for at least thirty minutes. Following this treatment the patient is permitted to rest for a short interval, then the ultraviolet irradiation is given by means of a nasal quartz applicator. This, of course, entails the use of the water cooled lamp. The lamp irradiations in the nose should not be more than two minutes, at first, and seldom, if ever, over four. Mucous membranes are not so tolerant as skin surfaces, and the dangers of severe reactions and burns must always be remembered.

The perennial type of hay fever does not require local measures. In fact, many cases are aggravated by nasal treatment. The time and duration of preventive treatment must at present be left to the discretion of the attending physician. Our experience during the past year convinced us that four weeks prior to the usual onset of symptoms is not too soon to commence active treatments, and these should be at very frequent intervals.

METHODS OF AUGMENTING CALCIUM CONTENT OF BLOOD

How are we to influence the disturbed calcium metabolism? We have already spoken of the value of calcium therapy combined with thyroid and parathyroid. We have stressed the importance of vigorous detoxication. We have not, however, discussed the extreme importance of fixing permanently the blood calcium content after it is raised. This may be accom-

plished by several different methods. Endocrine therapy, as already described, undoubtedly has a favorable effect in this connection. In other calcium deficiency diseases, such as rickets, prolonged administration of cod liver oil was found to maintain permanently a calcium increase. Intravenous calcium therapy raises the calcium content of the blood to normal, but just how long this figure is maintained is questionable. The fixing agent *par excellence* is the mercury vapor quartz lamp.

ACTION OF ULTRAVIOLET RAYS

What is the action of ultraviolet rays from an air cooled lamp? This question we can only attempt to answer theoretically. However, certain fundamental principles are well recognized. When the entire body is rayed, there is a general stimulating effect upon it. That this effect is produced by a certain action upon the blood, modifying the chemistry of it, seems to us to be the most plausible explanation. Blood serum shows an increased calcium content after ultraviolet irradiation in rachitis and in tetany. In these diseases a deficit of blood calcium and phosphorous is known to exist.

According to Sampson, the far ultraviolet and the extreme ultraviolet are stimulant and irritant and increase the leukocyte count materially for a comparatively long period. For constitutional treatments, when it is desired to influence the general metabolism, Sampson advocates ultraviolet irradiation, without the use of preceding local therapy.

Still another view is given by W. J. Turrell of Oxford, who concluded from an accumulation of evidence, derived from various sources and from various observers, that the action of ultraviolet rays on the tissues is one of oxidation or reduction.

This theory is explained on the basis of atomic structure, and the conclusion is "that the effect of U. V. R. (ultraviolet radiation) is to produce an oxidation or a reduction of those molecules whose vibrations have the same frequency as the radiation which falls upon it; and that this oxidation or reduction is the result of the resonant agitation excited in the atoms."

It is of interest also to speak of the immediate effects of the rays on the skin. That there is an increased physiologic action of the skin is not to be contradicted. After the first application, a dermatitis or mild erythema appears, the severity depending upon the amount of deposited skin pigment. This skin reaction does not occur with succeeding exposures. The protective action of skin pigment explains why negroes have to be exposed decidedly longer than white persons and why fair skinned and blond patients receive a marked skin irritation from the first application.

In hay fever and asthma, the effects of the irradiations from the quartz lamp are explained on the basis of a blood calcium deficit, and probably other actions with which we are unfamiliar at the present time. Some writers attribute the relief which patients obtain, in part at least, to the ozone which the lamp generates. There may be something in this. It is a point which is worthy of some thought. Others again are inclined to the view that it is the biologic influence which is of greater value.

That such an influence is paramount in the successful treatment of the hyperesthetic diseases according to the principles suggested is quite evident. The quartz lamp serves as a fixing agent. There is no other form of therapy which answers this purpose so well. Irradiation by means of the air cooled lamp, aside from other effects which may be produced, definitely and conclusively raises the blood calcium content and maintains it at normal or very close to this standard. The influence of the blood phosphorous will not be considered because our investigations have fairly well convinced us that the phosphorous content of the blood is of little significance in hay fever and asthma.

TECHNIQUE

The therapeutic technique in hay fever, both of the perennial and seasonal types, differs somewhat, and the same may be said also of asthma. In the perennial type of hay fever the time of the first treatment is one minute, and of the twelfth treatment, ten minutes. The average is six minutes. The total time which is consumed by 12 successive exposures is seventy-five minutes. The initial application is made with the distance between lamp and patient of 40 inches. This is gradually diminished until at the twelfth treatment a 12 inch distance is reached.

In seasonal hay fever and in asthma much more intensive raying is necessary. At first, a two to three minute exposure is made, with an average time during 12 treatments of nine and three-fourths minutes, and a total of 117 minutes. The distance between lamp and patient at first is 28 inches, and at the twelfth treatment, 12 inches.

TABULATED REPORT OF TREATMENT WITH QUARTZ LAMP (AIR COOLED)

	Time of First Treatment	Time of Twelfth Treatment	Average Time of Treatment	Total Time of Twelve Treatments	Average Time After Which Skin Reaction Was Produced	Distance of Lamp From Patient at First Treatment	Distance at Twelfth Treatment
Perennial Hay Fever.....	1 Min.	10 Min.	6 Min.	75 Min.	45 Min.	40 In.	12 In.
Seasonal Hay Fever and Asthma	2 Min.	20 Min.	9¾ Min.	117 Min.	38 Min.	28 In.	12 In.

Table showing results obtained in series of cases with reference to operative procedures and nasal treatments.

	Number of cases in which operation (nasal) was indicated and performed	Number of cases in which no nasal operative procedure was indicated	Number of cases in which only local nasal treatment was employed, without operation	Number of cases influenced favorably by combinations of the various procedures suggested in text of paper
Perennial Hay Fever....	21	73	36	85
Seasonal Hay Fever.....	90	52	39	88
Bronchial Asthma.....	41	7	7	27

CONCLUSIONS

It must be emphasized that ultraviolet therapy is not a panacea in the cure of hay fever and asthma. On the other hand, one can say unhesitatingly that the physician or specialist who does not utilize the quartz lamp and other physiotherapeutic modalities as adjuncts in the treatment of hay fever and asthma is failing to avail himself of modern valuable aids to ameliorate the distressing symptoms of these maladies. Again, one must remember that physiotherapy is not employed to the exclusion of other recognized methods. In our work, in hay fever and asthma, two essential avenues are exploited to the utmost, *viz.*, the local and the systemic. The local factors involve rigid medical and surgical intervention for the removal of every possible focus of infection, in particular that of the nose. The systemic factors include proper consideration of metabolic irregularities, nutritional disturbances, and endocrine dysfunctions. Every one of these phases must be studied at length and indications met as presented.

One more important point not covered in the text which has much to do with the successful handling of hay fever and asthmatic patients is hospitalization. Whenever at all possible this should be insisted upon to enhance our favorable results according to the old doctrine of *tuto, cito et jucunde.*

DISCUSSION

Dr. Mackey (Indiana): I would just like to ask whether in the prophylaxis of hay fever, after having given the course of treatment one year and had a fair success the succeeding years, you should keep this up.

Dr. T. B. Lacey (Glenwood, Iowa): Dr. Hollander referred to some form of calcium. To what particular form of calcium did he refer?

Dr. J. H. Lowrey (Neola, Iowa): I have always had the impression that asthmatic troubles were due to nasal irritation. I think it is twenty-four years ago in September that a gentleman came up to see me from a neighboring town that had had asthma fifty years. I inspected his nasal sinuses and I found them filled with polypi. Thirteen were taken out at one sitting. Returning home, he was put on a specific after treatment and in one week he was well. He never had a recurrence of his asthma, so I concluded that it was undoubtedly due to the polypi in his nose. I have had several experiences since then—one only this last summer. From this particular case I removed the turbinates on the left side. This patient got along very nicely that summer, but this summer he had the recurrence of hay fever and it was in the right nasal sinus. I naturally concluded that his hay fever was due to the irritation produced by the hypertrophied turbinates. Again, only about a month ago, a man came in to see me who had been suffering for the last two or three years with perennial hay fever. Five polypi were taken out of his left nostril and two from his right. He was very much relieved, but he still had a great deal of trouble in the right nasal sinus. When he came in the other day one more was removed, which had escaped my notice.

In reviewing thirty-odd years in this work it seems that most of our cases of asthma are due to some pathology. That has been my experience and it has been borne out by the work that I have done.

Dr. E. R. Herman (Chicago): I am very much interested in any cure for hay fever, because I have hay fever myself. I have tried everything so far and I shall be a patient of Dr. Hollender next year.

Now, a few things that have been said that I have tried: for instance, a calcium treatment. Some years ago I attempted to cure my hay fever with calcium; but it didn't do me a bit of good. I also tried vaccines and the only good they did was to produce a bad urticaria

all over me. I was sick in bed about three days and the hay fever was no better. Then I had to go to northern Michigan. This is a very important point that we hay fever victims remember:—go away, the most of them don't know why, but the reason for it is the rag weed. If I get away from the rag weed I don't have it. Last year I happened to take a trip to Europe and the European soil is so carefully tilled that there is no waste land and no rag week, and I didn't have my hay fever. Northern Michigan and California are perfectly free from rag weed and rag weed hay fever.

They used to tell us to try the autogeneous vaccines. I tried that on a patient. I made an autogeneous vaccine from the secretion of the nose and gave it to him and he had no hay fever. I tried it again with good results and the third time it failed and has failed ever since. I haven't as yet tried it on myself.

Then some fifteen or twenty years ago they suggested removing the mucous membrane in the nose. To this I objected and I am glad of it, for the rhinologists tell me now that is a dangerous procedure.

I cannot take time to relate the various other treatments that I have taken except to say that I have yet to try Dr. Hollender's method.

Dr. E. C. Folkmar (Washington, D. C.): Mr. Chairman, I feel the medical profession owes something to Dr. Hollender for what he is giving us in connection with the causative agents of hay fever and asthma. We have been filled with literature and are still being filled with literature that hay fever is due to irritations, and we still have this feeling that asthma is due to local conditions.

I have seen so many of them fail after having all kinds of nasal operations that we must conclude that the correction of the nasal condition does not always reach the fundamental trouble.

The fact that a number of individuals may be subjected to the same pollen conditions and only a few of them have hay fever and those same few, time and time again, would naturally suggest to us that there is something peculiar to that individual that is the cause of the hay fever rather than the pollen. There, I think, is where we are getting our suggestion from Dr. Hollender. These individuals are found by his studies, and by some studies that are being made by others, to be low in calcium. The study of some others has shown us that the patients that are low in calcium have a parathyroid dysfunction. Putting those two things together, that these patients have parathyroid dysfunction, and that they are low in calcium, then comes the therapy which has been suggested—a means that will result in a better functioning of those endocrines and will increase the calcium content.

One of our Danish experts showed by a number of experiments that it did no good to feed calcium to the individual so long as there was a dysfunction. Whatever was taken in the form of calcium would be eliminated within forty-eight hours.

Therefore, the first step is what Dr. Hollender has pointed out, correct your endocrine deficiency and correct the metabolic activity through your ultraviolet light. This means of therapy has been shown by various workers to increase the calcium content. Once you have accomplished that, then the body will be able to assimilate and take from the food the calcium it should have and keep it.

I wish to refer to the work that is being done at Madison, Wisconsin. Dr. Steinbach of Madison has been carrying on a number of experiments with rats, using the ultraviolet light. He has shown that proper application of the ultraviolet light will correct these conditions in animals that constitute the rachitic conditions in men. We have known for a long time that we could use cod liver oil in these conditions. Dr. Steinbach has taken cod liver oil and removed from it its qualities, which make it antirachitic, by use of alkalines. Then by subjecting this devitalized cod liver oil to the solar rays or ultraviolet rays he has been able to revitalize it and restore this property of an antirachitic.

The suggestion comes to me of using ultraviolet in connection with the food that these hay fever and asthmatic patients are given. Dr. Steinbach showed that he could take substances which were inert so far as the activity upon the prevention of rickets is concerned, subject them to the solar light or the ultraviolet ray and these substances, like lard and cocoa butter, would have as effective antirachitic properties when fed to the patient as cod liver oil had and this activity would be retained by these substances for five months. Maybe there is a suggestion here for us in connection with the food that we give our hay fever and asthmatic patients.

Dr. J. C. Elsom (Madison, Wis.): I happen to be a colleague of Dr. Steinbach, to whom Dr. Folkmar has referred as having made this ultraviolet experimentation on rats.

Perhaps I may explain to you a little more in detail some of these rather remarkable and rather spectacular experiments. Dr. Steinbach was rather loath for a long period to publish any of his experiments because they did seem so queer and so unbelievable; but by means of his experimentation on rats and

giving them foods which were deficient in certain elements, he induced in these rats a true form of rickets. On raying the rats with the ultraviolet light, not changing at all the character of the food which previously had been given, it was found that the rats in ninety-five per cent of the cases recovered. The only therapy which was given was the ultraviolet light.

Dr. Steinbach went a step further. He wanted to try the experiment in raying the food which he had fed to these rats, so with an air cooled ultraviolet light at a distance of fifteen inches, with an exposure of fifteen minutes, he rayed the various sorts of food which he was feeding to the rats. There was great astonishment. He found that by feeding to the same rats the same food which had previously been given them, with the exception that it had already been rayed with the ultraviolet, the rats recovered, *every one* of them. Microscopic examination of their bones showed that the rickets had entirely disappeared. This was remarkably interesting.

Dr. A. R. Hollender (Chicago): I shall take up only enough time in the discussion to emphasize a few points and to answer the questions which were asked.

One thing that is very fortunate in our beliefs, with reference to the methods which we advocate, is that we do not disbelieve that pollens and proteins are the external irritants. We don't take issue with that factor at all. However, we do say that unless an individual possesses some systemic dyscrasia, which predisposes or lays one susceptible, if you please, that individual will not be a subject of hay fever or asthma, regardless of whether he is exposed to these proteins and pollens or not. In other words, the statement made by Dr. Folkmar described that detail very markedly. We all live in the same climate, we all live in the same altitude, we are all confronted with the same conditions so far as atmosphere is concerned, and yet only certain ones of us get hay fever or asthma. That is simply because there are only certain ones of us that possess the systemic dyscrasia which lays us susceptible.

As to the form of calcium used it might suffice to say that in our preliminary work we used calcium lactate; but investigations, as we continued our work, convinced us that the chloride salt of calcium served much better than the lactate. Just why this is we will explain at a later time. At present we are using chiefly calcium chloride; and the best preparation of calcium chloride, which is palatable and overcomes a lot of the old difficulties with calcium chloride preparations, is called "Elixir Chloro-Calcium." In conjunction with this we give our endocrine combination in capsule form, which consists of parathyroid and thyroid extracts. The parathyroid average dose is one-tenth grain; the thyroid dose varies from one-fourteenth grain to one-half grain. The average dose is one-fourth grain. The thyroid extract that we are using is prepared from macerating the whole gland, and we are convinced in our own minds that there is an active principle in this entire glandular extract which enables us to get the good results.

Now, then, the question with reference to prophylaxis. This treatment has been conducted by us now for a period of four years and, while we hesitate to give out any conclusive results, we can say without hesitation that our experience has been in a large majority of cases that there was practically no recurrence, except in some instances, and in those few instances responses to a very moderate amount of treatment gave the results which were had in the preceding year.

There is no question about the subject of reflex asthma. It would be folly for me to stand here and argue against it. It would be folly for me to stand here and argue against the fact that a great many individuals are cured by nasal operations. That is all very true, but the indication for the operation was the septic focus upon which this whole theory, and this whole principle is based.

Furthermore, I have never yet seen an individual who had asthma due to nasal polypi who did not have a recurrence unless something more was done than just clipping out these nasal polypi. Nasal polypi invariably indicate an ethmoid involvement, and unless you do a radical job in the ethmoids, cleaning out the ethmoid cells, you are going to have a recurrence of your polypi and a recurrence of your asthma; that is, if *that* is the factor involved.

Now, regarding the statement that was made with reference to taking calcium. I am glad he made that statement, for the facts in connection with our work are very often misquoted. While this has been labeled calcium treatment, and all that, I want it understood that the administration of calcium so far as this method is concerned is the very smallest part of the treatment, and if you really want to know the secret of our method and the secret of our results, it is simply because we have taken these cases as they have come to us; we have hospitalized them, and we have individualized them in the diagnosis and in the treatment.

You cannot get one hundred per cent success in these cases by treating them as ambu-

lator cases, and there isn't a single individual who has hay fever and has had it year after year who has ever been systematically and thoroughly examined for the purpose of an accurate diagnosis, for the purpose of a determination of a septic focus and for the purpose of a detoxication by the methods which we advocate.

Now that is the secret of the whole thing. In hyperesthetic rhinitis or the perennial type of hay fever I challenge anybody to show me that you do not get a low blood calcium content invariably in one hundred per cent of the cases. I can say that because we have checked up on over 500 cases now, and I have yet to see a blood calcium content—that is, the laboratory report on it—which does not show a low blood calcium content. That is not true in the seasonable hay fever or in asthma. We are making no such claims in those conditions and we do appreciate and do realize that there are other factors, and we have labeled them the contributory etiological factors, which are just as important in these conditions as the low blood calcium if it is present.

BIBLIOGRAPHY

1. Halverson, J. O., Mohler, H. K., and Bergeim, Olaf: *The Calcium Content of the Blood Serum in Certain Pathologic Conditions*, J. Biol. Chem., 32:171, Nov., 1917.

2. Halverson, J. O., and Bergeim, Olaf: *The Determination of Small Amounts of Calcium, Particularly in Blood*, J. Biol. Chem., 32:159, Nov., 1917.

3. Kramer, B., and Tisdall, F. E.: *Simple Technic for the Determination of Calcium and Magnesium in Small Amounts of Serum*, J. Biol. Chem., 47:475, Aug., 1921.

4. Kramer, B., and Tisdall, F. F.: *Clinical Method for Quantitative Determination of Calcium and Magnesium in Small Amounts of Serum and Plasma*, Bull. Johns Hopkins Hosp., 32:44, Feb., 1921.

5. Dragstedt, L. R.: *The Pathogenesis of Parathyroid Tetany*, Am. J. Physiol., 63:408, Feb., 1924; J. A. M. A., 79:1593, Nov. 4, 1922.

6. *Old Theories and New Facts Regarding the Tetany Due to Parathyroidectomy*, Editorial, J. A. M. A., 80:774, March 17, 1923.

7. Luckhardt, A. B., and Goldberg, B.: *Presentation of the Life of Completely Parathyroidectomized Dogs*, J. A. M. A., 80:79, Jan. 13, 1923.

8. Luckhardt, A. B., and Rosenbloom, P. J.: *The Preventation and Control of Parathyroid Tetany*, Proc. Soc. Exper. Biol. & M., 19:129, 1921.

9. Salversen, H. A.: *Studies on the Physiology of the Parathyroid*, Proc. Soc. Exper. Biol. & Med., 20:204, 1922-3.

10. Tisdall, F. F.: *The Effects of the Ultraviolet Ray on the Calcium and Inorganic Phosphate Content of the Blood Serum of Rachitic Infants*, Canadian M. A. J., 12:536, Aug., 1922.

11. Hess, A. F.: *Influence of Light in Prevention and Cure of Rickets*, Lancet, 2:367, Aug. 19, 1922.

12. Kramer, B., Casparis, H. R., and Howland, J.: *Ultraviolet Radiation in Rickets: Effect on Calcium and Inorganic Phosphorus Concentration of Serum*, Am. J. Dis. Child., 24:20, July, 1922.

13. Huldschensky, K.: *Cure of Rickets by Means of Artificial Heliotherapy*, Deutsche med. Wchnschr., 45:712, June 26, 1919.

14. Novak, F. J., Jr., and Hollender, A. R.: *Influence of Ultraviolet Irradiation on Calcium Content of Blood Serum in Hay-fever, Hyperesthetic Rhinitis and the Asthmas: Preliminary Report*, J. A. M. A., 81:2003, Dec. 15, 1923.

15. Hollender, A. R.: *The Contributory Etiology, Prophylaxis and Calcium Role in Hay-Fever and Asthma*, Am. J. Clin. M., 31:223, April, 1924.

16. Hollender, A. R.: *Newer Aspects of the Hay-Fever Problem, With Special Reference to Preventive Treatment*, Wisconsin M. J., 23:29, June, 1924.

17. Novak, F. J., Jr., and Hollender, A. R.: *A New Treatment for Hay-Fever, Hyperesthetic Rhinitis and Bronchial Asthma, Based on the Calcium Content of the Blood Serum*, Illinois M. J., 45:283, April, 1924.

18. Hollender, A. R., and Cottle, M. H.: *The Role of Ultraviolet Light in the Treatment of Perennial and Seasonable Hay-Fever*, Eye, Ear, Nose & Throat Monthly, July, 1924.

19. Grayson, C. P.: *The Rational Treatment of the Constitutional Factor in the Causation of Hay-Fever*, Therap. Gaz., 13:653, 1897.

20. Vines, H. W. C.: *The Rationale of Parathyroid Therapy*, Brit. M. J., 2:854, Nov. 10, 1923.

21. Miller, J. E.: *Diagnosis and Treatment of Bronchial Asthma*, U. S. Nav. M. Bull., 19:311, Sept., 1923.

22. Stein, O. J.: *Survey of Hay-Fever Question*, Ann. Otol., Rhinol. & Laryngol., 32:1214, Dec., 1923.

23. Kern, Maximilian: *Parathyroid Therapy in Chronic Toxemias*, Amer. Jour. Clin. Med., July, 1924.

24. Novak, F. J.: *Basal Metabolism in Hyperaesthetic Rhinitis*, Wisconsin M. J., 19:534, March, 1921.

25. Simpson, W. L.: *Basal Metabolism in Hyperesthetic Rhinitis, Bronchial Asthma, etc.*, Laryngoscope, 32:768-774, Oct., 1922.

26. Perkins, J.: *A Study of Asthma,* Rhode Island M. J., 5:193, Feb., 1922.

27. Vander Veer, A., Jr.: *The Present Status of the Treatment of Hay-Fever and Asthma,* Am. J. M. Sc., 164:97-109, July, 1922.

28. Vaughn, W. T.: *Specific Treatment of Hay-Fever During the Attack,* J. A. M. A., 80: 245, Jan. 27, 1923.

29. Schliack: *Prevention and Treatment of Bronchial Asthma and Hay Fever With Highly Concentrated Solutions of Calcium Chloride,* Muncher med. Wchnsch., 70:398, March 30, 1923.

30. Myers, Victor C.: *Practical Chemical Analysis of Blood,* p. 174, C. V. Mosby Co., St. Louis, Mo., 1924.

31. Haseltine, Burton: *A New Conception and Successful Treatment of Bronchial Asthma,* Med. Times, 52:49, March, 1924.

30 North Michigan Avenue.

The Radiability of Gall Stones: A Series of Surgical Cases*

LEON T. LEWALD, M. D.,
Professor of Roentgenology, New York University; Director Roentgen Department, St. Luke's Hospital, and E. N. Gibbs Memorial X Ray Laboratory,
New York City.

THE question as to the percentage of gall stones which can be shown radiographically has been discussed by a number of observers during the past ten years. Percentages vary from one-half of one per cent to one hundred per cent. The lack of agreement has made it seem advisable to approach the problem from another standpoint. This has been done by studying the unopened gallbladder immediately upon its removal from the patient in the operating room, and placing it upon an x ray film and exposing it for a suitable time.

A study of several hundred gallbladders in this way has furnished us such definite information that we have been able to draw certain conclusions as to the radiability of gall stones. In a large percentage of the cases we have also had opportunity to radiograph the patient before operation, so that we have been able to check the results of positive and negative preoperative radiographic findings in regard to the gallbladder.

As a result of this work we are able to divide all gall stones into five classes:

1. Gall stones which are uniformly more dense than the surrounding bile.
2. Gall stones whose borders are more dense than the surrounding bile.
3. Gall stones whose centers are more dense than the surrounding bile.
4. Gall stones which are uniformly less dense than the surrounding bile.
5. Gall stones which are equal in density to the surrounding bile.

While certain deductions have been made in regard to the relative percentage of each of these five classes, the series is hardly large enough to warrant placing emphasis on the exact percentage. However, certain conclusions seem well justified. First, whereas it is well known that gall stones in class one, namely, those whose density is uniformly greater than the surrounding bile, should always be detected on routine radiographic examination, it is just as certain that those in class five, namely, those whose density throughout is equal to that of the surrounding bile, can *not* be shown radiographically by any known present technique. Occasionally the stones of class one are even dense enough to be shown fluoroscopically. Gall stones in class two, namely, those whose borders are of greater density than the surrounding bile, can be shown radiographically, provided careful technique is followed, particularly the use of the Potter-Bucky diaphragm, short exposures, and immobilization of the patient. Gall stones in class three, namely, those whose centers are more dense than the surrounding bile, may be shown with the same technique used in class two. Gall stones in class four, namely, those which are uniformly less dense throughout, may occasionally be shown owing to the fact that they are less dense than the surrounding structures and may be seen as negative shadows, but there is always the danger of confusing them with gas shadows. Gall stones of class five, namely, those which are of equal density with the surrounding bile, cannot be shown radiographically by present methods, as there is no differentiation between them and surrounding structures.

It is suggested, however, that a technique might be developed whereby, by the adminis-

*Read at the annual meeting of the Radiological Society of North America, December 8, 1922, Detroit.

tration of certain drugs, *the density of the bile itself might be increased* by the elimination of these drugs through the bile and thus produce a difference in density between the heavier bile and the gall stones. This has been easily accomplished experimentally on removed gallbladders and we are enlisting the cooperation of a number of observers in an effort to try out this method experimentally. Encouragement is lent to this theoretical possibility by work done on the urinary tract by Dr. School in the Urological Department of the Mayo Clinic. Dr. School has been able to produce cystograms by the intravenous injection of sodium iodid. Cystograms thus produced have been surprisingly good.

Dr. B. B. Vincent Lyon of Philadelphia stated in a personal communication that, after nonsurgical drainage of the biliary tract according to his method, x ray studies of the gallbladder region sometimes gave information that was not obtainable before drainage, indicating that the radiability of gall stones of a density about equal to that of normal bile may be increased by this procedure.

Occasionally a gallbladder may be encountered in which the bile has naturally become sufficiently dense to cast a shadow on the radiographic film or even to be visible in the fluoroscope. If a gallbladder of this type contains stones of equal or less density with the bile they will show by contrast. In fact, it was observations made from a case of this kind which suggested the possibility of artificially increasing the density of the bile in order to render visible biliary calculi of lighter density.

This case will illustrate the method of study.

Case 1: H. H., male, age 49, has suffered for several years with "indigestion." November 14, 1922, x ray examination of the gallbladder region disclosed no definite shadow of gall stones. The gallbladder was not visible. The following day the patient was operated upon by Dr. W. A. Downes. The gallbladder was found moderately distended, with thickened walls, and measured 12 by 4.5 cm. (4½ by 1¾ in.). It contained two calculi each about 1.5 cm. in diameter. Radiograph of the gallbladder after removal shows the two calculi are about equal in density to the surrounding bile, with a few small irregular areas of increased density.

The bile was removed from the gallbladder and diluted with an equal part of a solution of sodium bromide used in pyelography. This made a 10 per cent solution of sodium bromide and bile. This was replaced in the gall bladder and a radiograph made. This gave a remarkable contrast between the artificially dense bile and the two stones of like density. The mixture was then removed from the gallbladder and diluted with water to make a 5 per cent solution. The gallbladder was then refilled with this solution and radiographed. The two calculi were distinctly outlined by the surrounding bile. The procedure was repeated, using a 2 per cent solution. The calculi were still very sharply outlined. No attempt was made at this time to determine the weakest possible solution which would obtain a shadow of sufficient density to outline the calculi.

It is hoped that some substance can be found which would be excreted in the bile in sufficient quantity to increase the density. This would make it possible to show gall stones of types four and five and thus render all types of gall stones demonstrable radiographically, in certain locations.

Radium Treatment of Epithelioma of the Face*

WILLIAM H. KENNEDY, M. D.,

Indianapolis, Indiana.

THE diagnosis of epithelioma of the skin, and particularly the face, is a relatively simple matter in comparison with the diagnosis of cancer of the visceral organs. A study of the lesion and its surrounding tissue including palpation and, oftentimes, a history of a previous lesion, will usually clinch a tentative diagnosis.

Epithelioma of the face is a condition, for the relief of which a patient will seek the advice of a physician at an earlier stage than for a similar condition elsewhere on or in the body. It may safely be said that were the public in general as much concerned about its physical welfare generally, as about the amelioration or cure of an unsightly condition about the face, greater progress in the treatment of cancer would result. Not alone must this anxiety be attributed to pride in ones personal appearance, nor even the fear of pain or of ultimate death, but it is in a great measure traceable to the fact that any progress of

*Received for publication January 5, 1925.

morbidity in this region would greatly interfere with the necessary normal and regular habits such as speaking, seeing, eating, or cause the involvement of other functions of the organs of the head.

It is, of course, requisite that every physician be acquainted with the various characteristic symptoms of malignant tumors; in addition, a knowledge of the clinical characteristics of precancerous lesions is essential. It is a safe rule to consider any tissue in which any morbid change has taken place as potentially precancerous. Warts, moles and flat elevations of the skin may be regarded as harmless for a period of time only; later, many of these lesions destroy the skin, ulcerate, become unsightly, and refuse to heal under ordinary treatment. Only too frequently are these patients' fears allayed with a wave of the hand, and they are advised "not to bother about it until it bothers you." In many instances this advice will be followed by a visit at a later date, when the lesion will have grown—perhaps to the size of a quarter of a dollar or larger—having burrowed into the deeper tissues, the bone being exposed in many cases. Such a condition is oftentimes refractory, although it may be possible to destroy the malignant cells, surgical operation being at times required in addition to the application of radium. However, the former procedure would have been found unnecessary had the patient received the proper advice at the start. Nevertheless, even in these cases where there is an involvement of bone, radium, uncomplimented by any other form of treatment, frequently arrests the condition, oftentimes curing it completely. Morrow and Taussig (1) corroborate these views, as a result of their experience with bone involvement, going so far as to state that it is more particularly in the extensive and difficult cases that radium stands out as the only satisfactory form of treatment.

Among other potential factors, in addition to those already stated, in the causation of epithelioma of the face, senile keratoses undoubtedly form one of the largest groups, and they, too, are frequently viewed as harmless. Although the greatest proportion of these brownish, pigmented, grayish white or elevated spots prove to be so, many unsightly epitheliomata have been traced to this origin. A rough, scaly appearance of these skin lesions with, frequently, a tightly adherent dry scab, may be regarded as an indication of malignancy. Late and more serious symptoms are a tendency to bleed, in addition to the development of a hemorrhagic crust.

The factor of irritation, whether of a chemical, biochemical or mechanical nature, has been conceded as a contributory means in furthering the morbid process. Starting with a leukoplakia, ulcer, new growth, scar, nevus, pigmented mole, or one of the various other dermatoses, such processes as chewing, smoking, shaving, pricking, constant rubbing by a collar, a hat or any other article of clothing

Fig. 1—Epithelioma of the right cheek.
Fig. 2—Patient in figure 1 after treatment.
Fig. 3—Epithelioma of the neck.
Fig. 4—Patient in figure 3 after treatment.

may easily be held responsible for the production of the malignant state.

Age, too, appears to be a factor in the etiology of epitheliomata of the face, most of the patients presenting themselves for examination being over sixty years of age. Likewise, the general physical condition of the patient seems to play its role, while seborrhea and actinic sun rays are also considered as contributory causes.

In this connection, it may be recalled that many of these subjects who come for diagnosis or treatment are persons who lead outdoor lives, being regularly exposed to the rays of the sun, and who have florid, seborrheic complexions. Precancerous keratoses in persons of this description particularly demand special consideration and treatment.

It cannot be too strongly emphasized that prophylaxis in epithelioma of the face can only be established through the recognition of precancerous skin lesions, followed by adequate and thoroughly efficient treatment.

The malignant disease being once established, there are two potent factors which greatly contribute toward a favorable prognosis, *viz.*, (1), the accessibility of the morbid area, and (2), an early diagnosis. Fortunately, through various sources, the public is gradually being educated, if not to the point of actual recognition of the cancerous state, at least insofar as to appreciate the vital importance of consulting a competent physician, upon the development of certain symptoms. This important step in the right direction, coupled with the reasons above referred to for presenting himself at an earlier stage in the process than formerly, account, to some extent, for the greater percentage of cures in these cases.

A further and equally important reason is the improvement, within a comparatively recent period, in therapeutic management of these facial epitheliomata; and it is the purpose of the writer to illustrate that malignant growths of the face and neck can be eradicated in practically every case, if treated by suitable methods and at a sufficiently early period.

The object in any form of treatment of cancer is to effect a permanent cure by the removal of malignant cells, either by causing their death or by excision. Epithelioma may be treated surgically with wide excision of the lesion, but the resulting scar is objectionable particularly for the cosmetic effect and the danger of malformation of the eyelids, mouth, or other organ in its vicinity. Furthermore, because of the extent and location of the lesion, surgery is oftentimes not to be attempted with promise of good results. Even though the surgeon makes an incision one or two centimeters beyond the margin of the neoplasm, and even though he thoroughly cauterizes the cut surface, the possibility still remains that he may have disseminated the cancer cells or that he may not have reached the outer border of the growth. To substantiate these statements, it may be of interest to quote Dr. Ochsner (2) in a recent article on *Cancer from the Surgical Standpoint*, in which he says, "a knife passing through tissue in-

Fig. 5—Epithelioma of the right side of nose.
Fig. 6—Patient in figure 5 after treatment.
Fig. 7—Epithelioma of the neck.
Fig. 8—Patient in figure 7 after treatment.
Fig. 9—Epithelioma of the cheek.
Fig. 10—Patient in figure 9 after treatment.

fected with cancer may act as a means of carrying cancer infection into portions of the non-infected wound." This writer adds that "in operating with the knife, one is constantly being tempted to take away as little tissue as possible, in order to secure a cosmetically perfect effect."

The use of radium in the treatment of epithelioma of the face has gradually become the procedure of choice, and with good reason. As a result of its employment in the hands of a competent radiologist, the disadvantages just referred to are eliminated. There is no chance of hemorrhage, no disfiguring scar, and the possibility of disseminating cancer cells is obviated. In addition, under proper control of the amount of radiation, all the malignant cells will be destroyed. The scar produced as a result of radium therapy is smooth, soft and pliable, offering no resistance to the facial muscles, and leaving no unsightly blemish. In addition to the cosmetic and mechanical advantages of radium as compared with the surgical process, it has the supreme advantage of being a painless procedure. The specificity of radium has been clearly demonstrated by many competent radiologists. By regulating the dose so that there is only a slight inflammatory reaction of the normal tissue, the cells may be destroyed without ulceration.

However, the fact must not be overlooked that, since there are numerous types of epitheliomata, no one form of treatment can be equally effective for all. There obviously is a variation in their sensibility to radium, the basal cell variety being more amenable; and since the great majority of epitheliomata of the face are of this variety, the value of this form of treatment for malignancy of the face becomes apparent.

Before starting treatment, however, after a thorough study of the pathological condition of the malignant process, a further consideration of each case is essential, not the least important features being the general condition of the patient—following a thorough physical examination—in addition to such laboratory analysis as may be indicated. Procedures of this type will often prove to be wise precautionary measures.

In applying radium in facial carcinomata—if a series of treatments are undertaken—it must be borne in mind that the same surrounding normal cells are irradiated each time, although different malignant ones are usually selected, thus gradually causing the normal tissue to be less radioresistant. The writer has for this reason been administering the entire dose at one sitting where a cure, and not merely palliative treatment, is to be effected. Radium may be applied in various ways: either by means of buried tubes, needles, or by surface applications. Surface treatment has been considered by the present writer to be the most effective form of administration in these conditions about the face, having been employed in the great majority of his cases.

The factors which influence the therapeutic result are: (1), the amount of radium employed; (2), the length of application; (3), screening; (4), cross firing, and (5), distance. Most of these phases of the procedure, to a great extent, are variously employed as a result of the personal experience of each radiologist, and have been gradually developed by him through careful study, observation, and the special requirements in individual cases—a fact which accounts for the diversity of technique in the administration of radium therapy. It is earnestly to be hoped that a universal standardization will result before very long, as a result of combined valuable experience.

The illustrations which accompany this article are typical cases showing a certain amount of similarity, particularly as to results, including the cosmetic effect—a factor which should command due consideration in every case.

REFERENCES

1. Morrow, H., and Taussig, L.: *Epitheliomas of the Face and Their Treatment with Radium*, Arch. Dermat. & Syph., 5:73, Jan., 1922.

2. Ochsner, A. J.: *Cancer From the Surgical Standpoint*. Radiol., 4:384-386, Nov., 1923.

Physiotherapy From the Standpoint of the Man in General Practice*

B. H. SHERMAN, M. D.,

Dexter, Iowa.

I am not a specialist. I live and practice in the country, at a country cross roads. In fact the town in which I live is just a wide place in the road with a few low buildings on either side to break the monotony, so it is to the general practitioner, not the specialist, to whom this paper is directed.

This paper will not be scientific for I am not a scientist. It will follow no certain lines, "isms," or "asms," but will depict the results of physiotherapy as I feel that I have gotten them in general practice. I shall not try to cover all the phases of physiotherapy, but I hope that some suggestions dropped here will help my brother practitioner in his daily toils, to employ measures that will really cure and not simply relieve temporarily some of the conditions we find in every day practice.

No attempt will be made to explain why certain results are obtained from the use of individual types of current, or modality—we will leave that to others, as far as we are concerned it is simply a matter of getting results.

Since the introduction of electricity into therapeutics, it has been looked upon by many as a graft pure and simple, and this idea has not been materially helped by the teachings even of the present day colleges, where very little is being taught as to its uses except in a psychic measure. In other words, common medical opinion is that the duty of physiotherapy is to make an impression on the patient's mind—a kind of mind over matter affair, not that there is any real benefit in it, but simply a matter of bluffing the patient into getting well. Now this thing still exists to a great extent and I believe we as physicians forget at times that great strides are being made along the line of physiotherapy, the same as in other lines, and that we are living in a rapidly moving age. If we do not want to get run over by the band wagon we needs must get in it, or get out of the way.

I must confess that before I took up this method of therapy to any great extent, the results claimed by physiotherapists in general were "too good to be true" and it was always a more or less pleasant pastime to sit back and hear papers and discussions on this subject, which were taken with much salt, often not considering the source. But things have changed, and it is with no small amount of pleasure and satisfaction that I look back upon the past months and see the improvement that even I have made in my small practice, in relieving many acute conditions which we meet every day, not to mention those constant callers that are want to make the doctor's life burdensome, *viz.*, the "chronic."

In the good old summer time when the average general practitioner has gone into a state of hibernation, so to speak, and has turned his practice over to the "chiro," the "osteo," *et al.*, this is the time when the physiotherapist begins to make hay. He welcomes the so-called chronic, who after all has something really the matter with him, sometimes very tangible at that, but suppose he is the same old chronic to whom you have given every color of pill in stock with the same result—I should say no result. Here is where physiotherapy begins; and, shall we make another correction, continues with greater force than ever. It relieves, yes, and cures many of these same patients. Granted that many are deranged only in the head, yet they think it is somewhere else and unless you give them relief, be it physical or psychic, they will drift, as they have been drifting from time immemorial, into the hands of the advertising specialist or some other type of quack of which we have several varieties.

It is becoming more evident each year if we, as doctors, expect to succeed, we will have to take a brace. The time is fast fading away when the full equipment of an up-to-the-minute doctor's office may consist of a table, two chairs, and a spittoon. There are many accessories in the modern office that are real aids in diagnosis, and in treatment they are invaluable. Unless we avail ourselves of them we are surely inviting disaster. Of course, there are many who will say they have a good practice, have gotten along all these years without these things and feel that they have done good work, too. Now I am not question-

*Read at the Interstate Society of Radiology and Physiotherapy meeting, Sept., 1923.

ing their sincerity any more than I am the doctor that sticks to Old Dobbin in preference to the modern mode of transportation, but my advice to him would be to shoot old Spark Plug and buy a Ford.

I do not mean by this that one would dispense with any of the previous helps that we have had in diagnosis and treatment, but for the sake of humanity, and our own protection, let us avail ourselves of these instruments of precision that have been worked out to aid in a better diagnosis and treatment.

It goes without saying that a complete history is the first requisite in the treatment of any condition and the history of the case should not be considered complete until the patient is discharged. In other words, an accurate record should be kept of each treatment and the effect upon the patient noted upon the chart, so that variations may be made in treatment as the case progresses, and it is only by eternal vigilance that results may be obtained.

Let us presume that a patient with high blood pressure comes to our attention. A detailed clinical and laboratory examination is made and it is decided that autocondensation is the choice of procedure. Systolic, diastolic and pulse pressure are recorded. At each subsequent treatment these pressures are taken. Other examinations suggested symptomatically are made, for although our efforts are to correct the hypertension, we must not lose sight of the individual, and must correct his habits and prescribe drugs, if necessary, to get the best results together with autocondensation.

Before acquiring my apparatus I had many cases of hypertension that did not yield to drugs, one in particular that the nitrates, iodides, glandular extracts, etc., did not even temporarily relieve. The only drug that seemed to reduce his high blood pressure in any way was 30 minims tincture of veratrum, the action of which was only temporary. This case to my surprise yielded to autocondensation readily. After treatment by autocondensation his blood pressure, which ranged between 250 and 260 systolic, now has permanently dropped to 150 or 170, and he has resumed very active work and takes no drugs whatever.

I have been using a small portable high frequency outfit in my work, which may be used in any home where there is alternating current. It has also proven efficacious at the office. It has given excellent results in the treatment of high blood pressure, lumbago, neuritis and all inflammatory conditions.

I believe doctors are divided into two general classes, good and bad, and the distinction between them is, the good ones examine their patients while the bad ones do not. By examination I mean the exhaustion of every avenue through which disease may enter. This includes besides the routine history, physical, and laboratory measures, the x raying of the teeth, the gastro-intestinal canal or any portion of the anatomy that seems to point to disease. Having made a diagnosis from the correlation of these findings, before beginning treatment, one should inquire into the personal habits of the patient. A very close questioning along this line may turn failure into success. It is quite obvious that all the autocondensation in the world would fail to relieve a gluttonous individual and as far as that goes *any* type of therapy may be defeated if applied indiscriminately.

Actinic lamps are probably the best investment the general practitioner can make, being employed in more of the usual ailments with which he comes in contact. It is quite surprising the quick and permanent relief gained from a very few treatments. For those very severe, acute coughs that medical treatment completely fails to relieve and which the patient has always been prone to wear out, also that chronic bronchitis that some patients have had for years, for these actinic therapy readily produces for a large percentage, relief. In fact all types of bronchial infection, whether acute or chronic, asthmatic or tuberculous, are greatly relieved and most of them cured by this mode of treatment.

The rule we have followed in actinic therapy is to use it wherever infection is present: as in boils, carbuncles, bone felons, erysipelas and septic infections of all kinds. Speaking of bone felons, there is probably no more painful and frequent a condition that we have to deal with. It is very comforting to the patient to know that he will not have to walk the floor the following night, for after one or two treatments he will be able to sleep, and after a few more treatments the infection will subside in many cases, without even having to lance.

We have been using the water cooled lamp to disinfect fresh wounds and in infected wounds it is indispensible.

In the treatment of erysipelas, we get probably the most spectacular and unexpected results. One or two treatments generally suffice to bring back to normal, or nearly so, a face so swollen and distorted that you could not identify the patient, and by the third exposure the fever has subsided, the pulse has returned to normal, and the patient will declare he is well.

In treating boils, carbuncles, and other infections, it might be well to add that if pus is there it should be lanced at once. But as a rule the infection is not ripe, so to speak, but is painful. It does not contain pus and an application or two of the actinic ray will cause it to either fade away or break down into pus, usually within twenty-four hours.

In conclusion let us keep in mind that we do not have to surrender one thing that has helped us in the past. We have left to help us our many useful drugs, and do not forget them in your enthusiasm over the use of physiotherapy. It is true in many cases that drugs are superfluous but where they are indicated, use them. Remember that medicine is not an exact science, for after all, we are treating individuals, no two of which are exactly alike physically any more than they look alike, or are alike mentally. They have different dispositions and react differently to treatment. Therefore, let us not condemn *any* type of treatment until it has been definitely proven as worthless, nor should we condemn physiotherapy until we have satisfied ourselves:

First. That our diagnosis is as near perfect as possible.

Second. That the right modality is being correctly applied.

Third. That all conflicting habits of the patient have been corrected.

Fourth. That where drugs are indicated they be given, and;

Fifth. That we do not lose sight of the fact that we are treating individuals with different environments, different habits, different reactions, and that the rule of thumb has no place in the treatment of disease.

DISCUSSION

Q. Did you treat forty minutes with the ray at one time?

DR. SHERMAN: I used the pelvic diathermy.

Q. Did you use the d'Arsonval diathermy or the indirect method?

A. The d'Arsonval current was used with one pad over the lower lumbar region and the other above the apeces. The current was applied to the point of toleration. In using diathermy, I always commence with about 200 milliamperes and gradually increase for five minutes up to the point of toleration, and possibly a little more. When they complain of heat, we reduce the amperage to the point where it is comfortable. Let it remain thirty minutes, and take five minutes turning it off.

Q. Where do you put the bulbs?

A. One over the lower lumbar and the other over the hypogastric region. Allow me to cite a case which will illustrate my point. I had a queer experience I might report at this time. A lady, 32 years of age, the daughter of one of my colleagues, was brought to his home with hyperemesis gravidarium. She suffered until spontaneous miscarriage occurred at three months. On the third day following that she had a severe chill, rising fever and pulse, and continued pains which seemed to be uterine contractions. The uterus seemed to have emptied completely at the time of this spontaneous delivery. The doctor in charge was right there. He examined her and decided that delivery had been complete; but she had all the signs of septic infection. The symptoms progressed and the usual treatment was given—watchful expectancy, as DeLee would say.

She was treated until the third week, when I was called back on the case. At that time, she had a pulse of 138 and a temperature of 101 degrees to 103½ degrees, and although in fair spirits, her rest was broken and she had no appetite. She was treated expectantly for ten days. The laboratory diagnosis showed a pure culture of streptococcus taken from the cervix and a mixed infection from the vulva. She had a leukocytosis as high as 16,000. Toward the latter part it seemed advisable to give the usual Fowler's position for drainage and the Murphy drip. A blood transfusion was finally advised, but was refused.

As a last resort, I decided to give her treatment with the actinic lamp. To this, the old doctor said, "let the woman die in peace." However, he finally submitted and the treatment was administered. On examination, no localization could be found at any point. The pains had stopped and it seemed to have been just a septicemia.

The day we started the treatment, her fever was at 103½ degrees, pulse 138, leukocytosis 16,000, the patient becoming more emaciated every day. That Sunday evening, we started the lamp. Thursday we examined her and there was evidence of a localization in the cul-de-sac. The days wore on, and by Saturday she had quite an accumulation. By Sunday you could get fluctuation. Monday morning was set for drainage. Sunday evening, after I had reached home, they called me, saying that pus was draining from the vulva.

She made an uneventful recovery. Whether the lamp had anything to do with her marked improvement I do not know. Her hemoglobin was 70 per cent and the red blood count was 3,100,000. On the following Sunday, another blood count was made and there were 4,800,000 reds and over 16,000 whites, and the hemoglobin as nearly normal.

DR. B. B. GROVER: This is a most remarkable paper on the subject of physiotherapy. I was especially interested in his case of puerperal infection, because it read like the history of a case in which I was called in consultation two months ago.

This lady was confined about the middle of May, and she had a very severe postpartum hemorrhage. She was exsanguinated. On the fifth day, she had a chill and her temperature rose rapidly to 104 degrees. Phlegmasia of the left limb set in and she was treated in the regular orthodox way for five weeks. Her temperature was still 103 degrees. Her blood pressure was 60 systolic. I do not remember her blood count, red cells, but it was very low. I remember distinctly the white blood count was 16,000.

Instead of using the actinic ray, I applied diathermy to the pelvis. I gave her two treatments of forty minutes each for five days—in all, ten treatments. Her temperature became normal. Her white count went down to 8,000, and the hemoglobin had increased from 40 to 80 per cent. All troubles ceased, and she made an uninterrupted recovery.

Did diathermy do her any good? I think it did.

Q. What actinic ray do you use—air cooled or water cooled—and what distance and time?

A. I have used them both, indiscriminately, I was going to say, but not quite as bad as that.

If you are treating a boil or some type of infection like that, I use the water cooled lamp, placing it nearly in contact with the condition to be treated. Our treatments have run about the same way. With the water cooled lamp, we use one and one-half minute exposure and a rod or tube through which we treat nearly in contact with the condition.

With the water cooled lamp, you must size up your patient, because a blonde is comparatively easily scorched. Our treatment with them was fifty seconds at a distance of thirty inches, increasing that to one minute in every case, whether with water or air cooled. It is from twenty-four to thirty inches distant, giving fifty seconds to blondes, and to dark skinned people from one and one-fourth to one and one-half minutes. Each day we increase one minute.

Q. The method of application in this particular case of puerperal fever is what I was trying to find out.

A. We used the air cooled lamp on the plan New York City uses to disinfect its water supply. They tell me in New York City, for years they have used an actinic lamp to destroy the bacteria in the water. All the water drank in New York passes through one of these electric cylinders and is treated by actinic ray. They say as to the bactericidal content of that water, that there is something put in it in this way that is an active germicide. For from twenty-four to thirty-six hours after the water has been treated by the ray, it will kill any type of bacteria put in it.

The patient was nude and the light applied at twenty-four inches. The first treatment was given both anteriorly and posteriorly for one minute. The next day we gave two minutes, and followed it right up. During the first three or four treatments the patient had to be turned by the nurse. She was unable to get over onto her stomach. Towards the last she could easily roll over.

Q. You did not use the water cooled lamp with the vaginal applicator?

A. We did not.

Actinic Therapy in General Practice*

M. WOOD, M. D.,

Tekamah, Nebraska.

THE water cooled lamp is primarily bactericidal. For this reason, it has been given preference to the air cooled lamp in the treatment of psoriasis, with the idea of getting a better effect. Blistering is the most extreme effect that it is possible to get with the actinic ray. When one hears it said, by either a doctor or a member of the laity, that "I was terribly burned by actinic ray," qualify it, for either they did not get actinic, or they did not get the burn. The worst that can be done by actinic ray, is to produce a sunburn blister.

The water cooled lamp is used in all instances where a bactericidal effect is primarily desired, although that effect can be obtained from the air cooled lamp as well, especially from the close up treatments. One should screen off these areas for treatment rather definitely, but the half minute treat-

*Given at the X Ray, Radium and Physiotherapy Meeting, Omaha, Nebr., Oct. 6, 1924.

ment is, as a rule, not too severe, although one does double up over some of the areas. Always screen the area around the eyes, for the effect of the actinic ray on the conjunctiva produces a temporary irritation.

A more common condition that may be treated with the water cooled lamp is the nevus capillaris, or port wine mark, which must be treated by compression. A very deep effect on the port wine mark, can be obtained by using ten minutes treatment. One must blister the tissue and get a very intense effect. Wait until the reaction subsides before this treatment is repeated. Probably two or three treatments over the area will be necessary before obtaining a cure. There is no other condition in which greater intensity is necessary in order to get results.

The water cooled lamp has been used to great advantage in such infectious conditions as carbuncles. The relief of pain in these conditions is almost immediate, and the end results very gratifying.

DISCUSSION

Q. In using actinic ray, is there a thickening of the skin?

A. No, and one must get penetration. The actinic ray does not penetrate ordinarily beyond the blood stream. The hemoglobin in the blood stream absorbs actinic light rapidly, and dehematization can be produced only by pressure or injecting adrenalin.

Q. Is actinic ray a new form of energy?

A. The actinic ray is not a new form of energy. As far back as 1801 it was known that there were other than the visible light rays. Ritter discovered this, and later investigations and research proved his theory. Since that time much work has been done among the investigators of photochemistry, so that we now have the water and air cooled lamps. Other lamps were developed, but the most efficient form is the quartz lamp. I think the quartz glass is used in these lamps because it is moderate in cost, rendering it more practical. Other kinds of glass are used, but they are too expensive. The quartz light transmits a large percentage of actinic ray—about 27 per cent.

Actinic ray was first discovered in the ordinary sunlight. One of the men who is at present using the sun as a source of actinic ray for his treatments in tuberculous conditions, very effectively, is Rollier, in the Alps. Sunlight is beneficial in all forms of tuberculosis of the joints, and almost every form other than the pulmonary type.

The wave length as obtained from the sunlight is a comparatively long ray—about 2900 Angstrom units. In the air cooled lamp, only the longer wave lengths are given off, called the near actinic, or the biological ray, which is, roughly speaking, of a wave length of 1,000 to 2,000 Angstrom units.

The Angstrom unit is the unit by which all light rays are measured. It is 1/10,000,000 of a millimeter, or 1/250,000,000 of an inch, which is a very short length; but it can be measured by the instruments of precision very accurately.

Q. Why is not the air cooled lamp as bactericidal as the water cooled lamp?

A. The water cooled lamp is more especially bactericidal because it yields shorter wave actinic rays and transmits those rays more effectively than the air cooled lamp. In the latter there is a cloak of mercury vapor which is generated by the current in passing through, which filters out the shorter wave length rays. This vapor sheet which envelops the inside of the burner is precipitated in the water cooled lamp and consequently the shorter wave length rays are not filtered out, but pass through, and produce their bactericidal effect. For this reason the water cooled lamp is superior to the air cooled in its bactericidal action.

The Most Helpful Agent in Treatment of Malignancy: High Voltage X Ray Therapy*

ROSCOE L. SMITH, M. D.,

Lincoln, Nebraska.

MUCH has been said relative to the roentgen treatment of neoplasms, especially during the past two or three years.

There has been little change in the application since Dessauer of the methods of producing and applying x ray on deep seated pathology. His method is available to all, and has been reconsidered dozens of times, and appeared in every radiological magazine in the United States. Therefore, the physics of the Dessauer method will not be reviewed.

*Read at the Interstate Society of Radiology and Physiotherapy meeting, Sept., 1923.

The unsatisfied medical mind, however, is not content, and is constantly remeasuring and figuring on changes that may improve results. Their efforts have met with but little success and his method has been changed but little.

In our laboratory we have been using this method for the past two years, and the improvements in our results brought about by its adoption, have unquestionably justified the change from low to high voltage apparatus, from short focal skin distance to longer focal distance, from fractional dosage to massive dosage, and from light to greater filtration.

The conditions governing the treatment of neoplasms, vary only with location and accessibility. It is necessary to administer sufficient x ray radiation to the pathological tissue to produce destruction or retardation of its growth.

For the sake of brevity and as a basis for discussion, I will discuss carcinoma of the female breast. Roentgenologists are faced with the same old problems that have handicapped the surgeons for the past seventy-five years, and although we have dealt with them as roentgenologists for only a short time, they are just as evident.

We cannot hope to resurrect the dead, nor should we expect to cure advanced cancer of the breast. Like the surgeon, we must ask for our patient before the disease has invaded the body tissues. It is easy for the roentgenologist or surgeon to cause an early carcinoma of the breast to disappear, but it is impossible for either to cure malignancy when once established. Roentgenologists have been criticized rather severely for their failure to cure breast cancer, because they have accepted advanced cases for treatment and not explained to those concerned that they could offer only palliation.

Statistics show the average surgeon has had but 10 per cent of cures over a period of five years. In other words, his method is 90 per cent failure. I cannot state accurately what percentage will remain well five years or more following radiation, but I have no doubt that the percentage will be much higher.

However, it is not my desire to provoke a quarrel with the surgeon, but to be more friendly and offer him strict cooperation in the treatment of breast cancer, which will improve his results remarkably and help reduce the frightful mortality. Because of this disastrous situation, the surgeon has developed a boldness in dealing with cancer that permits him the most hazardous and mutilating of all surgical procedures, with little improvement in results, and more fear and aversion in the mind of his patient.

Roentgenologists have proven time and time again that proper x ray radiation applied to breast cancers cause them to disappear until they are no longer palpable, but these same tumors may recur unless excised.

The following three cases may serve as illustrations, although I realize fully it is impossible to compare any two individuals suffering from carcinoma of the breast. One individual may have a scirrhous carcinoma which is slow growing and late to metastasize, and with a natural immunity or resistance, which assists materially in any type treatment to be employed. Another case may suffer from a medullary carcinoma which grows rapidly, is very destructive and metastasizes early, the patient possessing little or no immunity.

Let us consider cases who represent patient with early carcinomata of the breast:

Woman, 50, tall and thin, had had no knowledge of the breast tumor, until it was discovered during a general examination following an automobile accident which had produced a fracture of the right humerus. Her fracture was treated and when healing was established, she was given an erythema skin dose using 200,000 volts, 4 ma. current, 50 cm. distance, 3/4 m. m. of copper filtration, for three hours. At the end of six weeks, the tumor was not palpable. Surgery was advised and accepted. A circular amputation of the breast was performed, abandoning the unusual mutilating operation. A careful examination of the amputated breast with numerous sections showed a small area of degenerated malignant cells, probably active enough to re-establish themselves, if allowed to remain. Her convalescence was uneventful, but before leaving the hospital she was given a similar erythema dose, covering the chest wall at the site of operation, the axilla, and supraclavicular region. The patient has developed no undesirable symptoms and remains well to date.

The second patient, an individual in perfect health, 39 years of age, rather short, stocky build, discovered a nodule in the breast because of a conversation with her niece, a registered nurse. She was treated with a similar erythema dose applied to the tumor, the axilla and the supraclavicular region. At the end of two months, the tumor had disappeared. She was also advised to have the breast removed and undergo additional treatments. Her pride and false security prevented her from following our advice. Today this patient is on her death bed, suffering from a general

carcinomatosis, with involvement of practically every bone in her body.

The third illustration chanced to be the mother of one of my good friends and brother physician. She had concealed her pathology until the growth was extensive enough to produce hemorrhage, and in this way was discovered. Her lesion was advanced, and surgery was out of the question. We, therefore, accepted her condition as such and applied x ray as a palliative method of treatment. To our surprise, the tumor disappeared and she apparently regained her health, only later to appear with an aggravating cough and positive roentgen evidence of secondary cancer of the lung. With as much enthusiasm as one defeated could assume, I again advised roentgen treatment for the lung tumor, which promptly disappeared, together with all the symptoms, and a year having elapsed, during which the patient enjoyed excellent health.

Many experiences have taught me that surgery or x ray as single agents are inadequate. It is only by the correct cooperative application of the two methods that we may expect improvement in our results. We have found that preoperative radiation is of more value than postoperative radiation. Surgery as a single agent has failed almost completely. X ray as a single agent has also failed, but not to the same degree. From the combined method, surgery together with pre and postoperative radiation, we have increased our percentage of living patients and I feel positive that time will verify our enthusiasm for this combined method. We believe advanced nonsurgical tumors should be treated with x ray, and our results, even with the older method of radiation, have justified our method of procedure.

CONCLUSIONS

Time has proven that x ray and surgery are the most dependable methods of treatment, and we believe the successful treatment of neoplasm requires the closest possible cooperation between the surgeon and roentgenologist.

DISCUSSION

A. F. Tyler, M. D., (Omaha, Nebr.): I want to compliment the speaker on his presentation of this subject. The experience which he has had in the treatment of malignancies with the shorter wave length x rays has been wide, and his judgment is good. I can only corroborate what he has said.

Our experience has shown in many cases where preoperative raying is used, that the tumor disappears so that there is no need of operation. In many cases where surgery has been contraindicated because of a heart or kidney lesion, or by refusal of the patient to have surgery, we have treated many cases of extensive carcinoma of the breast where no surgery had been employed. These masses have disappeared. The breast became very soft and pliable like it should normally feel, and the enlarged glands in the axilla and even those in the subclavicular region, disappeared. My records will give us statistics as to the length of time they remained in this condition.

If it is possible to do this much with these inoperable cases, it stands to reason it is possible to do as much for those which are operable; although at the present time surgery is considered to be the best treatment for operable cases.

CASE REPORTS

Acute Necrotizing Gastritis With Inflammatory Mass in Cardiac Portion of the Stomach*

ALBERT M. PFEFFER, M. D.,

Cleveland, Ohio.

GASTRIC inflammatory masses resembling new growths are usually either leutic, tuberculous, or resulting from long standing gastric ulcer. Most of those masses are in the pyloric region. The case here reported is one of an inflammatory necrotizing gastritis with a mass markedly resembling a new growth located in the cardiac end of the stomach, in a patient who has never had ulcer symptoms and where pathological section as well as all

*Received for publication, Jan. 5, 1925.

clinical findings definitely eliminate any luetic or tuberculous nature. Thorough searching of the literature fails to find any reports of a similar case. Needless to state that no textbook makes any mention of this condition.

HISTORY

Mrs. C., 46, of negative previous history was referred for x ray examination by Dr. A. J. Schlink five days after a fainting spell followed by hematemesis. Amount of blood vomited was about one pint. For some time previous to admission into the Woman's Hospital, the patient had noted a progressive pallor, weakness, and occasional nausea. Never was there any epigastric pain. Dr. Schlink ordered perfect rest and put her on a high caloric fluid diet. Examination was mainly negative except for the pallor, a slight systolic murmur at the apex, and slight epigastric tenderness. The stools were tarry, containing microscopic blood. Urine examinations were negative. A blood examination resulted in the following findings:

Haemoglobin: 45-50 per cent.
R. B. C.: 2,800,000.
W. B. C.: 5,500.
Color Index: —1.

Differential:

Polymorphonuclears	67 per cent
Large Lymphocytes	20 per cent
Small Lymphocytes	13 per cent

There were no poikilocytes, no nucleated red cells. There were, however, many vacuolated red cells, hence, a typical picture of secondary anemia.

There was no effort made at obtaining the stomach contents for analysis for fear of causing another hemorrhage.

X RAY EXAMINATION

The extreme weakness of the patient did not permit thorough roentgenological study. A few plates of only one position, and a short roentgenoscopic observation were made. A fainting spell caused the interruption of any further observation. The following were the findings:

1. Preliminary roentgenoscopy of the chest revealed fairly normal thoracic organs, except for perhaps a slightly enlarged cardiac shadow.

2. The oesaphagus was well visualized, appearing quite normal.

3. The stomach was readily visualized upon ingestion of the barium suspension. It appeared to be quite normal as to general outline, size, and position. Peristalsis was rather vivid.

4. In the pars cardiaca, just below the gas bubble, there appeared a semilunar shaped filling defect of irregular outline, about 4½ inches in length and 1 to 1½ inches in width. It appeared to arise from either the anterior or posterior wall near the lesser curvature. The edges appeared rather clear cut giving no impression of invasion. Manipulation was avoided for fear of causing a hemorrhage, so that a thorough roentgenoscopic idea of its extent could not be demonstrated.

5. Further examination showed that emptying time was normal; that all other parts of the intestinal tracts were fairly normal.

Based upon these findings a diagnosis of the presence of some new growth in the cardiac end of the stomach was made with the suggestion that due to absence of invasion, the unusual location, and the sex of the patient, the new growth was probably benign. Consultation with other roentgenologists brought differing opinions, the majority inclining to diagnose it a malignant tumor.

Fig. 1—Filling defect in the cardia.

SURGICAL FINDINGS

Laparotomy was made by Dr. H. A. Schlink. An incision was made through the anterior wall of the stomach which was entirely free from the mass. A tumor mass of firm, fibrous consistency, whitish in appearance, was found springing from the posterior wall. Dimensions and general outline corresponded to the roentgenographic appearance. The mass was easily enucleated from the gastric wall. The wounds were then sutured. The patient made an un-

eventful recovery with no further recurrence of symptoms.

PATHOLOGICAL FINDINGS

The following pathological findings and diagnosis were reported by Dr. B. S. Kline, pathologist of the Hospital:

Gross Description: Specimen consists of a mass of fleshy, firm whitish tissue 3 to 6 cm. long, 4 to 5 cm. wide and 1 cm. thick. On section the tissue was everywhere translucent to opaque in color, and in places translucent only.

Microscopic Description: Two sections of the stomach, each 1¼ by 1 cm., show smooth muscle with numerous areas of necrosis and intense pus cell infiltration. No granulation tissue, nor tumor appeared in the sections.

DIAGNOSIS

Final Diagnosis: Acute Necrotizing Gastritis.

COMMENTS

The acute necrotizing process, as seen in the microscopic slide, explains well the occurrences of the acute hemorrhages as well as the constant loss of blood. Hyperperistalsis and hypermotility was probably due to reflex irritation. Three cases of benign tumors described by Basch (1) showed similar hyperperistalsis. One must wonder at the absence of incisure or other signs of spasticity, in view of the fact that the necrotic process had extended into the muscular layers.

Of the conditions in which tumors are produced by inflammatory lesions of the stomach, syphilis is the best known for its marked roentgenological resemblance to carcinoma. Differential diagnosis is fairly easy, as the patient is usually under the cancer age and not ill in proportion to the extent of the disease shown in the roentgenogram.

Of rare occurrence is the neoplastic type of tuberculosis of the stomach. Carman (2) describes one case, and notes that this form of tuberculosis of the stomach affects more frequently the pyloric portion. Various textbooks mention the hyperplastic form of tuberculosis of the stomach.

The hyperplastic form of gastric ulcer is well known, so that every roentgenologist has had the occasion of differentiating it from carcinoma. Textbooks usually give a comprehensive description of the differential diagnosis between gastric ulcer of long standing with hyperplasia and gastric carcinoma. C. A. Hammann (3) discusses a large number of conditions in the various systems where inflammatory processes simulate neoplasms. A number of cases are cited where inflammatory processes simulated tumor masses in bones, in muscles, in the abdominal walls, in the mammary gland, in the omentum, and in the stomach.

The striking feature, however, is the fact that these inflammatory processes are the result of a chronic hyperplastic process. The case under discussion is one in which an acute necrotizing process took place. It is probably reasonable to assume that the acute necrotizing process has supervened on an already existing chronic inflammatory process.

SUMMARY

A case of acute necrotizing gastritis with an inflammatory mass in the pars cardiaca of the stomach giving roentgenological findings of a benign tumor is described.

An inflammatory mass in the cardia may be found without any previous history of ulcer symptoms, and without any marked roentgen findings of irritation or spasticity.

BIBLIOGRAPHY

Basch, S.: *Primary Benign Growths of the Stomach.* Surg. Gyn. & Obst., 22:165-170, Feb., 1916.

Carman, R. D.: *Roentgen Diagnosis of Diseases of the Alimentary Canal.* W. B. Saunders Co., Philadelphia, 1917, pp. 258-260.

Hamann, C. A.: *On the Simulation of Neoplasms by Inflammatory Processes,* Ann. of Surg., 51:782-795, June, 1910.

NEW EQUIPMENT

Largest and Smallest X Ray Tubes

GENERAL ELECTRIC COMPANY,

Schenectady, N. Y.

THE largest and smallest commercial Coolidge x ray tubes are shown in the accompanying illustration. The largest and most powerful is being used in cancer treatment; the smallest is used in the portable x ray outfit recently developed. The larger is

more than 100 times as powerful as the smaller one.

TECHNICAL DATA REGARDING TUBES

The largest commercial Coolidge tube operates at 250,000 volts and 50 milliamperes, with continuous output. The anode is water cooled, and the glass bulb is eight inches in diameter. Operation is in conjunction with a generating outfit consisting essentially of a high tension transformer, rectifying switch, and resistance control. An insulated water system is used in cooling the tube. It was developed primarily for cancer treatment, to reduce the time of exposure.

The smallest tube operates at 56,000 volts (maximum) and 10 milliamperes, and is mounted in oil. The bulb, 1½ inches in diameter, is of glass which contains 55 per cent by weight of lead. The wall thickness is 1/8-inch, and offers protection equal to 1/32-inch of sheet lead. The window from which the x rays emerge is of thin-walled, lead-free, lime glass. The tube is only four inches long. It is so small that, complete with its transformer and all other necessary parts, the outfit weighs about 20 pounds and occupies a box measuring 6½ by 10½ by 8¾ inches.

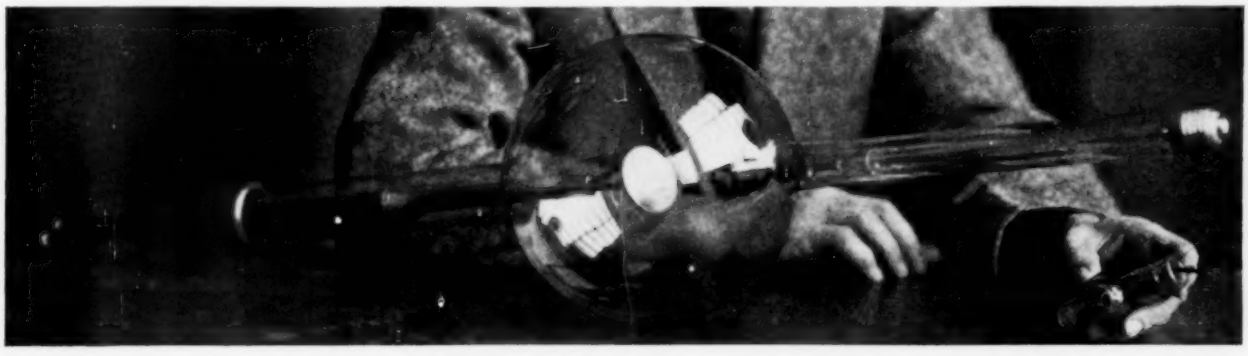


Fig. 1—Largest and smallest x ray tubes.

Foreign Body Fluroscope

PATTERSON SCREEN COMPANY,

Towanda, Pa.

THE Patterson Foreign Body Fluoroscope was developed from a suggestion and with the cooperation of Dr. Robert A. Arens, who in his work at the Michael Reese Hospital in Chicago, felt the need of a small fluoroscope that could be used when removing a foreign body with the aid of x rays.

After a foreign body has been located and its removal is anticipated on the fluoroscopic table, it is very inconvenient for the operator to work under the large fluoroscopic screen. We felt this condition warranted the manufacture of the Patterson Foreign Body Fluoroscope. It will also be convenient for fluoroscopy of parts where a large screen cannot be used.

The apparatus has been made small and circular so that instruments can be used around and under it conveniently. Parts that are likely to touch an open wound are all metal and can be sterilized in the same manner as the instruments. The Patterson Fluoroscopic Screen is 3½ inches in diameter and is mounted in a unit with lead glass. The apparatus is arranged so that the fluoroscopic screen unit can be easily removed when sterilizing the metal parts.

A magnifying glass is mounted above the screen on an adjustable post which may be of assistance when removing small parts like a needle point. The fluoroscope can be used without the lens if desired. This instrument has been so constructed that it may be taken apart for sterilization and when not in use may be kept in a small convenient carrying case which is supplied.

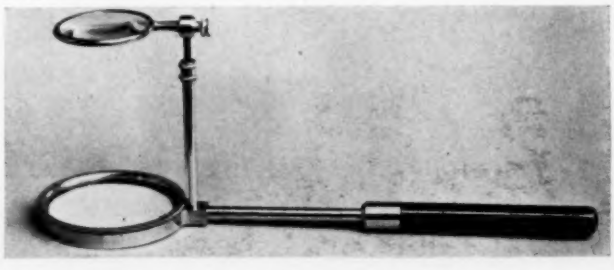


Fig. 1—Foreign body electroscope.

EDITORIAL

The JOURNAL OF RADIOLOGY

A Journal of Ideas and Ideals.

Subscriptions—In the United States, its possessions and Mexico, $5.00 yearly; Canada, $5.50; elsewhere, $6.50 the year.

Advertising rates on application. All advertising must conform to American Medical Assciation Rules.

Payments for subscriptions and advertising must be made to Radiological Publishing Co., in New York or Chicago Exchange.

Address all communications to Business Office, 121 South Thirty-third Street, Omaha, Nebraska.

Published monthly at Omaha, Nebraska, by the Radiological Publishing Company.

A. F. TYLER, M. D.
Managing Editor

Ultraviolet Irradiation vs. Hay Fever

THERE is usually some skepticism about the use of the ultraviolet ray and just what its value is in the treatment of hay fever and asthma. I wish, in an impromptu manner, to offer my observations and opinion. I believe the treatment of hay fever and asthma without the use of ultraviolet therapy would be an absolute failure. Not only do I believe that, but I know that to be a fact, because we have tried out both ways, and we have proven definitely and conclusively the theory—and I believe it is more than theory today because we have absolutely demonstrated it and nobody has had the audacity thus far to condemn it—that they are two calcium deficiency diseases, rickets and hay fever. In these diseases, the application of ultraviolet therapy is definitely indicated and must be employed if the best results are to be obtained.

In our own field in the eye, ear, nose and throat work, I do not know whether I really could practice today without the use of physiotherapy equipment. I know I could not do it satisfactorily. It has become such an integral part of our therapeutics, that to be without it altogether would handicap us to such a degree that we could not produce the results which we are now producing.

There are so many indications for the application of ultraviolet therapy in ophthalmology, otology, rhinology and laryngology. I need only mention such conditions as indolent corneal ulcers, chronic ulcers of various types, where of course, there is no bone involvement; the various types of rhinitis—the hypertrophied and atrophied type with its ozena characteristics; the various nonoperative throat conditions, and in particular, tuberculous laryngitis. I believe the time will come very soon when it will be definitely demonstrated that ultraviolet therapy is actually the most valuable aid in the treatment of tuberculous laryngitis.

In closing, let me add a word of warning. We are very apt to fall into a rut, with the application of ultraviolet therapy and other therapeutic measures, if we lean too much toward empiricism. If we are to establish these therapeutic measures and modalities on a permanent, scientific basis, we must aim to rationalize every therapeutic measure we employ. Ultraviolet therapy does not consist of shining a light on some bacteriological condition or on some fractional part of the body, and hoping thereby to get some definite improvement or a cure. It is more than mechanically applying a physical property. We must establish a definite indication for its use in each and every condition in which we use it. Unless we do that, we are going to fall down on the application of a real scientific advancement. Like a great many other *novel* things that have come and gone in the past decade or two, this form of therapy will also go unless, as I say, we rationalize every measure that we use, and establish all the therapeutic applications on a permanent, scientific basis.

A. R. HOLLANDER, M. D.

Prescribing Electricity

FOR long years the medical man has been the one to whom in times of physical distress the laity has turned for counsel, aid and advice. This means that for all those years the medical man has been a man who necessarily has used his head. Calm in the face of crisis, he has used his judgment to alleviate pain, and save life. Briefly, then, the medical man has been a man of judgment, and it is but consistent that he should still be the man of

judgment, in the use of the newer means and methods of treatment of which he has become and is becoming possessed.

This applies particularly to the field of physiotherapy which is coming so rapidly to the front the last few years. No one informed on the subject, doubts the true value of the various modalities offered for our use. Too many brilliant results have already been obtained in the hands of careful, sincere men, who have turned their attention to this field of usefulness. But—

In the face of such results let us not become faddists, or superenthusiasts. Let us not follow in the footsteps of the cults. This is the message I want to convey: Let us not only use but KEEP our heads.

Medical electricity in whatever form available at the present moment becomes to the careful, thinking man a valuable agent in many of the cases presented to his attention. It becomes a thing to be deliberately and selectively used, in exactly the same way and with the same definite intention, that the medical man employs a certain drug. Medical electricity is a thing to be *prescribed*.

It is not a cure-all. It is not a fake. It is a deliberately selective means to an end. Let this ideal be erected in the minds of its users and then let it be preserved. Medical men should not *give* electrical treatments. They should prescribe electrical treatment and if equipped with the modality required to affect the desired end, they may administer their own prescription, by the aid of a technician, or if desired, it may be administered by themselves. This may seem an unnecessary distinction, yet it is far more consequential, not only in its effect upon the patient, but upon the medical man himself. There is, if one may use the term, a pharmacy of electricity as well as of drugs. Certain modalities produce certain physical reactions. They would be worse than useless if they did not. Hence it is the part of the user to learn these effects, how obtained, and in what need required, as surely as in his student days in college he familiarized himself with the action of recognized medicaments. Indeed, he will still find that even in the use of electrical entities he cannot dispense with the chemical equation, and he will happily learn that the electrical modality properly prescribed will accentuate, and accelerate the use of internal medication to a surprising extent.

What I wish, if—as the Englishman says—you know what I mean, is to get the users of electrical therapeutics, be they whatever type they may, to think! Let us approach the matter from the quiet, scientific standpoint, and not rush madly into unknown fields. Let us be ethical in this—that we use these new weapons of attack in an understanding fashion; that we use them so well that we establish them on a firm foundation of general recognition, and thereby become ethical indeed. The proof of the pudding is in the eating. Nothing speaks louder than results. A favorable result is an unassailable argument. The day is coming and coming fast when physiotherapy will win a general recognition, just because it is daily proving its worth. In the meantime—and until that recognition becomes widespread enough to justify the establishment of chairs of instruction, as in time it must and will—let us, who as pioneers in this newer world of curative technique, so conduct ourselves as to justify this ultimate result. Calmly, quietly, and in a dignified manner, let us go forward, evaluating just what we have, employing it as scientifically as we may and as we ought without fear or favor, but with only one major end in view—the showing of benefit to those who need it by a calculated, understanding use of this newer means which is ours. Let us *prescribe* electricity in so intelligent a manner as to extend it far outside of any thought of contradiction and eventually prove our case, as prove it we will, since we are working with the TRUTH.

J. U. Giesy, M. D.

The End of the Spectrum

The following article appeared in the editorial section of the Boston Medical and Surgical Journal, Volume 191, Number 24, and is deemed worthy of republication and of the widest possible distribution:

THE value of the ultraviolet invisible end of the spectrum, with a wave length of approximately 2,000 Angstrom units, has long been suspected in medical therapeutics, and now seems to be definitely established. Hess, Park, Hoag and others have demonstrated its efficacy in the treatment and prevention of rickets and tetany. Rollier has been its most famous exponent in the treatment of tuberculosis, various observers have claimed unique results from its employment in certain skin conditions, and, as is usual in any new and spectacular therapeutic agent, it has been utilized in treating a variety of diseases from asthma to pelvic peritonitis with results that would be indeed startling if they could always be corroborated.

The most generally available as well as the least expensive source of ultraviolet light comes from the actinic ray of the sun; and at Alpine heights where atmospheric obstruction

is at a minimum, Rollier has met with deserved success in its employment in the treatment of tuberculosis. The sanatorium conducted by Lo Grosso at Perrysburg, New York, has also afforded a convincing demonstration of its value in this country. In all discussions of the merits of the invisible ultraviolet ray, however, it must be remembered that it cannot penetrate ordinary glass; exposure, to be effective, must be direct.

In the temperate zone and on the Atlantic seaboard the availability of the natural solar source of the ultraviolet ray is at a minimum. During our winter months, particularly when the sun's rays come always at an angle, a greater degree of light-absorbing moisture must be penetrated than at Alpine altitudes. The proportion of cloudy days is greater and climatic conditions often prohibit the desirable direct body exposure. To these facts must be attributed, at least in part, our greater incidence of tuberculosis and of rickets. Mankind in this zone is deprived of its most valuable germicidal agent and its most powerful hygienic factors.

It has been shown that an intense ultraviolet ray is generated by the mercury vapor lamp, and that this ray may be made available by the institution of transparent quartz for glass in the lamp. Such lamps have been in use for a number of years and their value has been clearly shown, even if we fail to accept the claims of some of the enthusiasts that their efficacy is greater than that of the sun itself. Whatever their virtue may be, it depends on the use of transparent quartz as a light transmitting substance, and despite the fact that a large part of the earth is composed of quartz in some form or other, this has been expensive and difficult to obtain in a practical form.

Recent experiments of the General Electric Company have shown, however, that fused quartz may be produced in a practical form, and such are the remarkable qualities of this mineral that the world may well be about to enter the Age of Quartz. Fused quartz is now produced under great pressure in the electric furnace at its melting point of about 4,000 degrees Fahrenheit; at this temperature it assumes the consistency of molasses in cold weather. Bubbles are greatly eliminated, first by the vacuum and then by the pressure obtained. Fused quartz is harder than platinum, with one-seventh of its coefficient of expansion. It retains its size and shape under repeated heating and cooling better than any other known substance. It is an almost perfect insulation. It may be heated above the melting point of gold and plunged into cold water without damage to itself. It is almost three times as transparent as glass, and is practically 100 per cent transparent to the ultraviolet ray, transmitting the entire spectral range from the shortest ultraviolet ray to the longest infrared, or heat red. It naturally tends to form such a smooth reflecting surface that the spectral rays escape from it only with the greatest difficulty, hence light or heat applied to one end of a tortuous rod will be emitted from the other end almost without loss. One end of such a rod may be placed in a fire and the opposite end will emit the heat while the shaft remains cool.

The possibilities of such a mineral in therapeutic medicine can be imagined, and they depend largely on this power of transmitting this life-protecting ultraviolet ray. The time may yet come when hospital solaria will be glassed with quartz windows or illuminated with quartz light bulbs. Inaccessible parts of the body may be irradiated by properly shaped tubes. Now that the means are at hand, new and more surprising uses for this substance will undoubtedly be discovered.

Dr. Frank Billings Honored

AT the last meeting of the American Stomatological Association Frank Billings, M. D., Sc. D., L. L. D., was elected Honorary Member of that Association. Dr. Billings was dean and professor of medicine at Rush Medical College and professor of physical diagnosis in the Medical School at Northwestern University. He is a nonresident Fellow of the College of Physicians, Philadelphia, and a member of leading American medical societies. Dr. Billings was a pioneer in the field of focal infection and his researches are well known to the medical and dental professions. In particular, his contributions to the study of stomatological infections have served as a stimulus in the growth of the American stomatological movement. Recently he has retired from active practice.

Physiotherapy Aide
Physiotherapy Pupil Aide
Physiotherapy Assistant

EXAMINATIONS for the above named positions will be held throughout the country on February 18, March 25, April 22, May 20 and June 24, 1925. They are to fill vacancies in the United States Veterans' Bureau and in the United States Public Health Service, at entrance salaries ranging from $720 to $1,320 a year.

The duties of physiotherapy aides will consist of administering physiotherapy in its several branches—massage, electrotherapy, hydrotherapy, mechanotherapy, thermotherapy; active, passive, resistive and assistive exercises and remedial gymnastics; keeping daily record of the work and progress of each and every patient coming under direction and treatment, and making the required reports of the activities of the reconstruction work in physiotherapy.

The duties of physiotherapy pupil aides will be the same as those for physiotherapy aide, except that they are pupils under the supervision and instruction of the chief aide in all the work above mentioned.

The duties of physiotherapy assistants will consist of administering to special cases the treatments of physiotherapy; as: massage, electrotherapy, hydrotherapy, thermotherapy, mechanotherapy; active, passive, assistive and resistive exercises; remedial gymnastics; keeping a daily report of the work and progress of each patient under the appointee's direction and treatment, and making the required reports of the activities of the reconstruction work in physiotherapy.

For full information and application blanks address the United States Civil Service Commission, Washington, D. C., or the secretary of the board of U. S. civil service examiners at the postoffice or customhouse in any city.

Call for Papers

THE program committee wishes all the members of the College who desire to appear on the program at the annual meeting to send in titles at once. Cooperation of the members in this matter will greatly aid the early arrangement of the program. It is desired that the following subjects be represented in their various phases:

X Ray Diagnosis, X Ray Therapy of Skin Lesions, X Ray Therapy of Deep Seated Lesions, Radium Therapy, Ultraviolet in Pediatrics, Ultraviolet in Pulmonary Tuberculosis, Ultraviolet in Nontuberculous Diseases of the Lungs, Surgical Diathermy in Benign Lesions, Surgical Diathermy in Carcinoma, Medical Diathermy in Gynecology, Medical Diathermy in Bone and Joint Diseases, Medical Diathermy in Traumatic Injuries, Galvanism in Gynecology, Galvanism in Proctology, Galvanism in the Treatment of Sinuses and Fistulæ, The Sine Wave Current in Medicine, The Uses of the Static Current in Medicine, Meliotherapy in Medicine, The Physics of Ultraviolet, The Physics of High Frequency Currents, The Physics of the Sine Wave Current, The Physics of the Static Current, The Physics of the Galvanic Current, The Physics of X Ray and Radium, The Pathology of Carcinoma of Various Types, Pathology of Bone Tumors, Pathology of Pulmonary Tuberculosis, Pathology of Nontuberculous Diseases of the Lungs, Instruction in Physiotherapy for Technicians and Aides, Medical Students and Medical Graduates.

It is hoped that the above list of subjects may aid the members of the College in stimulating thought in choosing the subject for the paper to be presented. This list is used only as a suggestion and is not claimed to be complete. Other subjects will naturally occur to various individuals and will be gladly received by the program committee.

Send in titles at once to the secretary, Dr. R. W. Fouts, 121 S. 33rd St., Omaha, Nebraska.

Program Committee

A. R. Hollender, M. D.,
James C. Elsom, M. D.,
R. W. Fouts, M. D.

PRESIDENT POPE has appointed the above members of the Program Committee, who have the responsibility of preparing the program for the Annual Meeting. Work already is under way and a valuable program is assured. The committee plans to arrange the program so that every branch of physical therapy will be represented.

Medical Dentistry in Italy

WORD has been received that the Council of Ministers in Italy has ratified and signed the proposed law of Dr. Chiavaro's, whereby the medical degree is necessary before the dental degree will be issued. From now on all dentists in Italy must have the essential preliminary medical training.

The success of such a long recognized prerequisite education is due directly to the efforts of Dr. Piperno.

ABSTRACTS and REVIEWS

Practical Aspects of Certain Phases of Treatment With Special Reference to Organotherapy and Physiotherapy. GEORGE B. EUSTERMAN, M. D., Ohio State M. J., 20:677-680, November, 1924.

PHYSIOTHERAPY is the treatment of disease by application of massage, heat, light, water and certain forms of electric current. In a comprehensive sense, x ray and radium may also be included. Physiotherapy is the basis of the successful treatment of chronic disease abroad and has been a potent factor in curtailing quackery. Physiotherapy is, however, becoming recognized in American Medical Universities. For example, during July and August, Harvard offered courses in major branches, and physiotherapy has been introduced into the curriculum of the Navy Medical School. It is stated by Billings that every hospital needs a physiotherapeutic department quite as much as it needs an operating room. Boston is said to be the only city that has a fully equipped and well run physiotherapy department in a municipal hospital. From an economic standpoint, physiotherapy has the appearance of an angel in disguise. In Europe, the shortening of the convalescence from accidents has reduced the workmen's compensation from 10 to 30 per cent in cases in which physiotherapy followed or was coincident with the usual surgical measures. One is also impressed with the high degree of development of massage, its allied branches and hydrotherapy in England and Germany.

In discussing radiotherapy, actinotherapy and thermotherapy, the author states that "in cutaneous lesions and diseases the x ray, radium and mercury vapor quartz light are frequently employed. The choice of the use of the first two agents rests upon the size and accessibility of the lesion, or the individual preference or experience of the operator. X ray treatment is generally recommended for acne, eczema, seborrheic dermatitis, lichen planus, ringworm, favus of the scalp, infectious localized granulomas and hyperhidrosis, and as a palliative in anal and vulvar pruritis, etc. Stokes and his colleagues are particularly partial to the treatment of acne, plantar and periungual warts by the x ray. Electrodessication is the treatment for other warts. Cancer of the skin, especially basal cell epithelioma, responds nicely to radium or x ray, although many authorities prefer radium, especially when the lesion is on the eyelid, canthi, nasolabial fold or on the nasal or buccal mucosa. Senile keratitis, especially of the scaly variety, leukoplakia and vascular nevi are especially amenable to radium.....In nodular, dense and deep seated lesions, preliminary electrocoagulation is indicated.....A less dangerous method, and one more popular with the practitioner, is the mercury vapor quartz light, which having a stimulative and bactericidal effect, is employed in the treatment of impetigo contagiosa, pityriasis rosacea, lupus vulgaris, alopecia areata and tricophyrosis, also in pyodermia, dermatitis papillaris capiti, certain forms of seborrheic dermatitis and port wine marks.

"Medical diathermy, or thermopenetration, has everything to recommend it, wherever heat has an established therapeutic effect. By this method the heat may be delivered to and definitely controlled at any desired depth. We have used it successfully for sprained joints, sciatica, neuritis, in fracture to reduce swelling, and with some success in the pains of infectious hypertrophic arthritis.....Improved diathermy is being effectively used in the treatment of accessible infected tissues, such as gonorrheal joints in both sexes, involvment of the female urethra and cervix, the epididymis and prostate. Favorable results in the treatment of pneumonia, and more recently in that of whooping cough, are of interest. Surgical diathermy is assuming greater importance in some clinics, especially in the removal of malignant and benign tumors of the face, skull and oropharynx. In more recent years its use has been advocated in urology, especially in the removal of tumors of the bladder and cancer of the prostate. Electrocoagulation is superior to the ordinary methods of cautery and, in working in the vicinity of large blood vessels, especially in the surgery of the head or face, preliminary ligation is essential. The employment of and indications for radium and x ray, singly or combined, in menorrhagia, fibromas and carcinoma of the cervix, are familiar to all of us. X ray treatment of Hodgkin's disease and lymphosarcoma and the combined use of the x ray in the two forms of leukemia, are particularly indicated. In more

recent years tuberculous peritonitis has been treated exclusively and quite successfully by the Alpine lamp or quartz lamp.

"Heliotherapy in the experienced hands of a man like Rollier is most effective in the treatment of various forms of tuberculosis. In carcinoma of the thyroid, which is an inoperable surgical condition, and in some cases of pancreatic cancer, striking palliative success has been obtained. The same may be said of Wills tumors of the kidney and instances of metastases from malignant tumors of the testicle to the peritoneal glands, particularly those of the basal-cell type.....The selection of cases for preoperative radiation are those in which we hope to have a reasonable expectation of complete cure following surgery..... Advanced cases of malignancy that do not respond favorably to radiotherapy are also inoperable for, as a rule, metastases to other organs has taken place."

Educational Advances in Physiotherapy. Norman Edwin Titus, M. D., Am. J. Electroth. & Radiol., 62:383-389, October, 1924.

THIS paper was presented before the American Electrotherapeutic Association by the author, as Chairman of the Committee on Promulgation of Education in Physiotherapy, instead of a committee report.

The first consideration to be made was on the question of nomenclature. Instead of the wide variety of terms—physical therapeutics, electrotherapeutics, etc.—*physiotherapy* was adopted as correct nomenclature.

The future of this particular branch of the medical science was discussed at length and particular mention made of the manner in which physiotherapeutic principles have been used and are being used, by those not capable nor medically authorized to attempt medication by this means, but are using the shield of experience and effects of those versed in the matter, together with standard physiotherapeutic nomeclature and manufacturers' "machines," for the purpose of pure financial gain. Mention was made of the manner of advertisement of the manufacturers of the physiotherapeutic apparatus, and an appeal made that every means be taken to eradicate by sweeping condemnation these "too frequent, alleged, irregular, medical cults" and the maintenance of such high standards of eligibility for practice as a physiotherapist that all quacks and quackery will be automatically ostracised.

Physiology of the Quartz Light. John Purl Parsons, M. D., J. Michigan State M. S., 24:19-22, January, 1925.

ULTRAVIOLET rays are the active rays of sunlight and are a very important regulator of metabolism for both plants and animals.

Disregarding their value as a counterirritant and in the healing of wounds, the rays should have their chief use in medicine as a prophylactic measure. Ultraviolet light is a specific in the treatment for rickets. It has also been shown to be a specific for tetany.

From both Hess's and Hoag's work it is obvious that the use of the light is indicated wherever there is a low blood calcium or phosphate. For this reason it has been used in cases of hypersensitive rhinitis, hay fever, and asthma. These patients seem to be benefited during the period of treatment, but there seems to be no permanent cure. It has also been pointed out that there is a low calcium content of the blood in pneumonia. In view of this fact, others have tried the therapeutic value of the quartz lamp in treating such cases. The benefit derived from such treatment is still questioned.

Ultraviolet light has been used in the various skin diseases such as eczema, psoriasis and simple infections of the skin. In these conditions, however, it is merely an aid. It has been found to be valuable in conjunction with a diet in the treatment of secondary anemias.

A group of cases which have proved most interesting at present is that of children between the ages of eighteen months and three years who will not eat. No cause can be found for this loss of appetite. By treating these patients with ultraviolet light, in many of them the desire for food returns and the results have been surprisingly good.

In all types of tuberculosis, the light has been used with quite good results.

The Physiologic Effect of Massage. Ralph Pemberton, M. D., F. A. Cajori, Ph. D., C. Y. Crouter, M. S., J. A. M. A., 83:1761-1763, November 29, 1924.

1. Massage of voluntary muscles, even though vigorous, is not accompanied by evidence of lactic acid production and acidosis, which accompany relatively mild active exercise of short duration, or by the evidence of loss of acid and alkalosis, which follow the exposure of the body to external heat.

2. Massage can be used as a partial substitute for active exercise in many conditions, but its benefit must be due chiefly to some mechanism other than that reflected in the chemical changes accompanying exercise. The available evidence suggests that these benefits are referable to changes in the circulation, especially capillary.

3. The favorable influences of the rheumatic syndrome of exposure to external heat, massage and active exercise apparently find their chief explanation in their influence on the circulation, including the capillary beds. The corollary to this is that a disturbance of the circulation constitutes part of the underlying pathologic change in rheumatic and arthritic conditions.

Measurement of Ultraviolet Light. A. Webster, F. C. S.; L. Hill, M. B., F. R. S.; A. Eidinow, M. B., B. S., Brit. J. Radiol., 29: 335-339, September, 1924.

AFTER a description of the use of the various rays, their synergistic reactions, and the older methods employed in their usage, the authors proceed: The rays which have the most active biological effect on the skin are the middle ultraviolet rays, those at and just on either side of 3,000 Angstrom units. These are the shortest rays present in the high sun on clear days which particularly produce sunburn and pigmentation.....Short ultraviolet rays do not penetrate to the deeper cells of the epidermis, and so, while very powerful in killing unicellular organisms into which they penetrate, have little or no action on the skin. Comparing the bleaching of the acetone methylene-blue with the action of the infusoria in quartz tubes and on the skin we find a general agreement. In the case of the mercury vapor lamp, it takes twice as long to bleach our standard acetone methylene-blue solution one point in our scale as to kill insuforia or to produce an erythema on the skin equal, on the Lovibond tintometer scale of colored glasses for skins, to 1 to 6 yellow to plus 1 to 5 red. In the case of the carbon arc, longer ultraviolet and the heating effect of infrared and visible rays so increase the biological effect of the middle ultraviolet rays that the bleaching time for acetone methylene-blue one point on the scale becomes four times as long as that on the above biological reactions.

The technique for the standardization might be summarized as follows: To two parts of the standard methylene-blue solution add one part of acetone and mix. Fill the standard quartz tube, an internal diameter of 3 mm., with this solution. Fill the standardizing, the unknown, tube to within ¼-inch of its top and cover with a rubber cap. Determine strength against the standard tubes. Expose to the sun. By determining the strength of the tint before exposure, errors due to fading or refractive power of the quartz tube are avoided. When the tube is exposed to the sun, avoid shadows, and place horizontal, with the length of the tube facing zenith. The time of the exposure varies with the seasons. In winter the tube can be exposed from 9 A. M. to 9 P. M. and the reduction for the whole day determined. In the spring the exposure time is shorter, say from 10 A. M. to 4 P. M. When comparing the exposed tube with the standards, hold the tubes at an angle of 45 degrees against a white background.

Wave Form and Efficiency: An Analysis of Roentgen Therapy Machines. W. Edward Chamberlain, M. D., and R. R. Newell, M. D., Am. J. Roentgenol., 12:509-513, December, 1924.

IN conclusion of their investigations, the authors point out:

1. High voltage roentgen therapy machines differ by as much as two times in their roentgen ray output per milliampere-minute even when crest kilovolts, filter, distance, area and mass irradiated are the same.

2. An analysis of the roentgen ray output of two very different machines demonstrates gross differences in wave form as the major reason for their difference in output.

The Treatment of Malignancy. George F. Thomas, M. D., and Roy G. Giles, M. D., Ohio State M. J., 21:5-11, January, 1925.

THE treatment of malignancy has generally been regarded as a surgical problem and the number of cases cured of cancer has undoubtedly been increased by the brilliant accomplishments of our leading surgeons in devising and standardizing various radical operations. But operation without removal of the furthermost limits of dissemination, even far beyond the areas of visible infiltration, can at the best be only a palliative measure.

It is with this viewpoint that the authors review the modern methods of treatment of malignancies. In superficial lesions radiotherapy is used since these superficial cancers respond readily to radiation and heal without deformity. No other method yields such desirable results. In the treatment of cancer of the lip, radium should be used locally and intensive x ray treatments should be given over the lymphatic field; while in the treatment of the pigmented mole, if surgical removal of a large mass of malignant tissue is indicated, and an incision wide of the field of involvement is not possible, the electric cautery or electrocoagulation should be used.

The question arises, which should be used, x ray or radium? In the absence of any demonstrated difference in physiological reaction, one must be guided in his choice by the physical and economical laws. Radium is the

instrument of choice when an intense or localized reaction is desired, the radium being applied directly to the lesion, whereas, when a homogeneous radiation of a large field is indicated, the use of the short wave length x rays, applied from a considerable distance, is more efficient. In some of the superficial lesions, heavy doses of unfiltered x rays are most helpful. The chief value of radium lies in the fact that it can be used to produce a very localized reaction within the cavities of the body.

It is realized by the authors that radiotherapy in the treatment is still on an entirely empirical basis, and in only certain types of superficial lesions can cure be assured. But until some specific cure is found, or until the etiology of cancer becomes known, all that medicine can hope to do is to keep the limitations of our knowledge in mind and treat the patient, not the disease. This requires intelligent cooperation between the surgeon and radiologist.

In conclusion, the authors note that "opinions expressed in the literature by various surgical authorities regarding the efficacy of radium and x rays in the treatment of malignancy differ considerably. As a rule, the favorable opinions must be accepted. The positive, good results secured prove the value of the method used. There is less ground for accepting the unfavorable opinions (in the light of our present knowledge). Definite conclusions from the failures are at the present time hardly justifiable in view of the uncertain methods of treatment used, and lack of knowledge of the actual dosage delivered to the diseased tissues. In some instances, the poor results were undoubtedly due to the type of lesion. In others, it is quite evident that the method was at fault. The failures, no matter how frequent, should not discourage us. Until more definite knowledge of the types of growth in which radiation is valueless is acquired, we must be guided by the abundance of evidence to the effect that radiotherapy in the majority of cases may be expected to be helpful."

The Experimental Pathology of Cancer. Francis Carter Wood, M. D., J. A. M. A., 84:4-8, January 3, 1925.

THE results of mechanical treatment of tumors of the breast by some of the practitioners of physiotherapeutic methods, are astonishing in demonstrating the rapidity with which a carcinoma can be distributed throughout the body in a short period.

Another condition to which transplanted tumors are admirably adapted was the determination of the biologic conditions of the destruction of tumor cells by radiation and heat. It is to irradiate or heat tumors either in the animal or in vitro, and thus determine the lethal dose of any type of radiation or other destructive physical agent. If the tumor cells grow, they are evidently alive; if they do not grow, they are evidently dead.

It has been found that the quantity of roentgen rays required to kill all the cells of an average animal tumor, when scattered and secondary irradiation is eliminated, is approximately five human skin erythema doses. This seems high, and has been repeatedly challenged by those unfamiliar with the method, and also by a few who are treating human tumors; but it is evident that there is but little difference between the animal tumor and that of man, for recent practical workers are stating that it takes from two to four erythema doses to kill human tumors, and agree that some are even more resistant. It is probable, therefore, that these mouse tumors are comparable in their death-point to the tumors of human beings, and that most of the clinical cures obtained in man are not due to the destruction of all of the cancer cells, but to the death, possibly, of a considerable portion, and the interference with the nutrition and growth of the remainder of the scar tissue that is produced.

It has been found that no matter what the filtration or the wave length of the roentgen ray that kills the tumor cell, the same number of human skin erythema doses is required. The biologic sensitivity of the human skin and that of the animal tumor are therefore parallel. By the use of an open ionization chamber to avoid all secondary radiation, it has also been shown that equal ionization doses of the same wave length kill in the same time; and that equal ionization doses of roentgen rays of different wave lengths are equally effective.

It is generally believed that radiation closes the lymphatics of the region exposed, and this has been brought forward as one of the chief arguments for the preoperative radiation. Experiments done in the laboratory of the author have shown that in animals the main lymph channels are not closed, at least within a period of two or three weeks, when exposed to doses of roentgen ray up to five human skin erythemas. One leg of an animal was irradiated, and the other reserved as a control; after a suitable period, the creature was killed and India ink injected into the fatpad on both sides. No diminution in the lumen of the irradiated channels could be observed.

It has been a matter of clinical observation that, after a tumor has been favorably influenced by irradiation and then recurs, the recurrence is less sensitive. Those whose opinions are entitled to respect have described this as an actual immunity to a physical agent, but it has seemed, in the eyes of the author, that the phenomenon is more easily explicable by assuming that, as the supporting connective tissues of the region have become largely devitalized by the effect of irradiation on the blood vessels, the inhibition or destruction of the tumor cells through injury of the capillaries can no longer be observed, but the result of the natural resistance of such cells to direct radiation is seen. An experiment performed by the author a number of years ago illustrates this point. The lethal point of a certain tumor to the roentgen rays was not altered by exposing that neoplasm to a sublethal dose, implanting, exposing the resulting tumors to a sublethal dose and so on. The death point remained constant, despite the repeated exposures to roentgen ray. On the other hand, Russ, using another tumor, has recently observed facts which he interprets as showing increased resistance. The question, therefore, remains unsettled.

It is the opinion of roentgenologists that the direct effects of irradiation are supplemented by an active destruction of the body tissues, either local or general. If this were so, the author points out that one might reasonably expect examples of spontaneous cure of primary cancer in human beings or animals. The extraordinary rarity of this phenomenon shows how improbable is any such active antagonism.

It is also a well known fact that a few tumor cells may remain in a scar, and a recurrence take place years after the operation. When recurrences, after ten years or more, have been excised and the sections compared with the originals, the morphology of the neoplastic tissue is often exactly the same, proving that cells from the primary tumor had remained quiescent for years. If there are any antagonistic forces available in the body, it is pertinent to inquire why they did not in all this time destroy the few remaining cancer cells.

Cancer grows best in young healthy animals and human beings and also in well vascularized tissue in which these hypothetic antagonistic forces might well be supposed to be most available. The extraordinary speed with which cancer grows in the breast of the pregnant human female is given as an adequate illustration. Nor do grafts take well in old or sickly animals. That food supply is in all probability the decisive question here, is the view of the writer. Keyser irradiated tumors in animals, planted some grafts immediately, and others after a lapse of a few days. The first took well, the latter did not. Hence he assumes that in the interval, the tissues helped to destroy the tumor. But the interpretation of the author differs markedly. During the elapsed period of from seven to ten days, the writer considers that the full irradiation effect of the tumor developed and the tumor cells were enfeebled. When transplanted, as most of the cells of even a healthy graft normally die, the enfeebled cells have but little chance to incite the necessary vascularity to enable them to proliferate, thus become established, and give rise to a tumor, which the freshly irradiated graft was unable to do. Murphy has shown that irradiating an area does not prevent tumor transplantation, a fact confirmed in the Wood laboratory. Every radiotherapeutist of experience will also bear witness to the fact that a recurrent cancer of the breast will grow through areas of tissue which has been previously thoroughly irradiated.

That any general beneficent reactions may be induced by distant irradiation is easily disproved, according to the author. In several patients receiving postoperative irradiation treatment in his clinic, not the slightest effect was discernible on keratoses and basal cell growths at a short distance from the irradiated area.

The Diagnosis of Cancer. JAMES EWING, M. D., J. A. M. A., 84:1-4, January 3, 1925.

ROENTGENOGRAPHY has greatly enlarged the opportunities for the study of gross anatomy of tumors. It should correspondingly reduce the indications for biopsies and exploratory operations. The pathologist should be thoroughly familiar with the data thus revealed and become an expert in their interpretation. In the field of bone tumors and in several other departments it has become an indispensible aid in diagnosis. There are comparatively few bone tumors that cannot be somewhat accurately classified by means of roentgenograms and clinical signs, and in the opinion of the author, conclusions drawn from the roentgenograms lead to rather more serviceable results than the study of fragments of tumor tissue taken under difficulties. Without the control of the roentgenogram, the diagnostician of bone tumors labors under severe handicaps. The roentgen ray is also of great service in excluding osteogenic origin of tumors.

The introduction of radiation treatment has emphasized the importance of the finer diagnosis of tumors, for without accurate knowl-

edge of the structure and natural course of the disease, the radiologist is seriously handicapped.

The results of radiation therapy have revealed some interesting data that may be useful in diagnosis. Giant cell tumors of bone respond to external radiation by preliminary swelling followed by regression and restoration of the shaft, while most osetogenic sarcomas exhibit no such changes or respond very slowly. A differential diagnosis may be reached and the case successfully treated in this manner. Very cellular myelomas and other round cell tumors also yield readily to radiation, while tumors that form bone or interstitial tissue are resistant.

Many lymphosarcomas melt down rapidly under radiation, and leave little fibrosis, while Hodgkin's granuloma is more resistant and generally leaves cicatricial masses. Simple hyperplastic tuberculous lymph nodes gradually recede under radiation, but if there is caseation or suppuration, the shrinkage is slight and the inflammatory process continues.

Areas of chronic mastitis become swollen and indurated under radiation treatment, while cancerous masses generally recede notably and leave very hard cicatrices.

Cellular testicular tumors recede promptly under radiation, while the adult types of teratoma with cartilage and epidermoid cysts (hydatid disease) show no such changes in volume.

Vascular fascial sarcomas of the intermuscular planes yield to radiation, while the ordinary neurogenic sarcoma is very resistant.

It seems probable that these observations and other such clinical data will eventually form an important body of diagnostic criteria which will replace many operative procedures.

Epithelioma of the Lip, Treated with Radium. Douglass W. Montgomery, M. D., and George D. Culver, M. D., Calif. & West. M., 22:628-631, December, 1924.

THE authors have treated in all, 69 cases of cancer of the lip with radium, of which 67 were of the lower lip and two of the upper. Of these patients, 66 were males and three females. The average age of the patients was fifty-one years.

In a follow-up manner, information was obtained pertaining 60 of the patients treated during 1917 and up to the present time. Forty-eight are still alive and apparently cured. It has not been possible to trace nine patients, several of whom it is reasonable to assume have died. Six of those traced are known to be deceased, but only two died from the effects of a cancerous process. One of these two was hopeless from the first, and the other, a man of 84, developed metastases and died.

In the treatment of these cases, unburied, heavily screened radium was used in all instances, and though needles were sometimes applied, they were arranged on a screen as a plaque applicator and were never inserted into the lip. In no cases have the authors used emanations; for the end results from the radium have been so satisfactory that they naturally favor their own method.

The time limit, in the minds of the authors, is a necessary point of decision, for with them, it has become a definite factor, more constant than either the arrangement of the radium used, whether in plaque, tube, or needle, or the milligram strength. Twenty-four hours' time is the usual allotment, and whether the amount of radium indicated is 25 milligrams or 150 milligrams, the hours of exposure do not vary greatly. The type, extent, and situation on the lip of the epithelioma govern the amount chosen. Screening equivalent to form one to two millimeters of lead and two to four millimeters of rubber has been found most satisfactory, the thickness of metal used being greater or less, according to the less or greater infiltration of the epithelioma treated.

"It is difficult to determine a definite percentage of cures, but at the most conservative estimate, it exceeds seventy-five, and this estimate is made without barring the hopeless and very elderly patients treated. It can readily be seen that the number of known failures is small—less than 10 per cent..... It is our belief that a malignant growth of the lip that can be successfully treated by any of the known methods can be more surely eradicated by the use of radium, either alone or in combination with whatever other means may be indicated, and the perfection of the cosmetic functional result cannot by other methods be equalled."

Carcinoma of the Stomach—Case Reports. W. L. Ross, M. D., Nebraska State M. J., 9:466-469, December, 1924.

IN this article the author presents complete case reports illustrating early diagnosis in, and the results obtained from fractional x ray dosages in the treatment of carcinoma of the stomach.

"In the treatment of these cases no attempt was made to destroy the malignancy en masse. But I hoped to so disable the cancer cells that the cells would no longer grow. This I succeeded in doing to the extent that the patients were clinically cured. Time alone will tell whether the remaining scar tissue will

not undergo malignant degeneration. In case three, a period of seven years has elapsed without clinical return of carcinoma."

Some Remarks on the Value of the Opaque Meal From the Point of View of the Physician. S. Wyard, M. D., Brit. J. Radiol., 29: 369-386, October, 1924.

VIEWING radiology from the standpoint of the general practitioner, the author offers some suggestions which he hopes will further the progress of one of the most valuable aids to clinical diagnosis. The radiological data, he asserts, are one factor in the diagnosis, and are to be considered as such in the relation to clinical and pathological data, as well as the history of the case. As to radiology commonly giving the wrong information, this, according to the author, is not a fact, but the information is in such characters that it cannot be interpreted. It is for this reason particularly the suggestions are made.

Progress can only be made along two lines: (1), perfection of technique, and, (2), improved interpretation. Both factors are obtainable by most painstaking study and years of practice. Nor is it sufficient for one to merely take the photographs for the clinician to interpret; but only by personal consultation can light be thrown on the many problems that may arise. Without the clinical findings the radiologist is extremely handicapped. The radiologist without this consultation will have only a slight knowledge of the symptoms and signs presented by the patient, and the physician will have but little knowledge of the features of the radiogram.

In the opinion of the author, one who is intending to use the x ray for purposes of diagnosis, should refrain from all therapeutic measures until the radiographic examination is complete. In such cases, radiography is capable of giving positive information of the very greatest value from the point of view of diagnosis and treatment of the following conditions: (1), Congenital anomalies, such as diaphragmatic hernia; (2), Gastroptosis; (3), Gastric Ulcer; (4), Carcinoma; (5), Gastrectasis; (6), Hypermotility; (7), Aerophagy; (8), Foreign Bodies. With particular reference to the stomach, the position of the organ, its size, shape, contour, peristalsis, rate of filling, and rate of emptying, may all be noted.

Non-Perforating Ulcers of the Stomach and Duodenum. J. Emmons Briggs, M. D., Boston M. & S. J., 191:1101-1105, December, 1924.

1. Carious and defective teeth are probably responsible for infections of the alimentary tract, gastric and duodenal ulcers, cholecystitis and appendicitis; hence the very frequent association of these diseases.

2. The most constant symptoms of ulcer are in the order mentioned: epigastric pain, loss of weight, vomiting, pyrosis, and hemorrhage.

3. History and x ray examination are the most important factors in diagnosis.

4. Gastro-enterostomy is the only treatment to be attempted.

5. A systematic follow-up system is the only way to obtain accurate knowledge concerning the end results.

Observations on Surgery of the Stomach. J. Garland Sherrill, M. D., Kentucky M. J., 22:530-534, December, 1924.

THE development of gastric surgery is one of the accomplishments of the last half century. In this great advance radiology has played an important role.

"A roentgenological examination requires a high degree of skill and wide experience to correctly interpret the findings. Just as the repeated observation of pathological conditions by the surgeon at the operating table, makes him a better pathologist and diagnostician, so does abundant material improve the diagnostic acumen of the roentgenologist.

"The surgeon who reads the plates with the roentgenologist and the roentgenologist who follows the patient to the operating table, each is made more proficient in his particular field."

The Treatment of Cancer of the Colon. Walter E. Sistrunk, M. D., J. Michigan State M. S., 24:28-32, January, 1925.

IT is advised by the author that after operation when the patients have gained sufficient strength to permit the use of x ray, they should be given a series of x ray exposures over the site of the operation, and over the glands draining this area. Postoperation radiation is recommended in all cases of cancer of the colon.

Ileocecal Tuberculosis. Jerome M. Lynch, M. D., J. A. M. A., 84:24-29, January 3, 1925.

ILEOCECAL tuberculosis, in the opinion of the author, is a very rare disease. When tuberculosis of the bowel does occur, it is more commonly found in younger individuals—in those usually under the age of 18. The etiological factor is considered the direct infection from contaminated milk, butter or meat from tuberculous cows. A common focus is

found in the lungs or in the bronchial glands. The diagnosis of the tuberculous process in the intestinal tract is difficult especially in the early stages.

There are three methods available for the diagnosis of this condition, i. e., the presence of tubercle bacilli in the stool, the roentgen ray, and the tuberculin test. If tubercle bacilli can be found in the stool, no further search is necessary, but unfortunately 79 per cent of ileocecal tuberculosis is secondary to a pulmonary or glandular involvement, and this method of diagnosis is useless. The tuberculin test on the same conditions, has been proven to have its drawbacks except in the primary infection. Roentgen ray also has its drawbacks. In the diagnosis of the three possible forms, nodular, ulcerative, or fibrous tuberculous lesion, the principal finding, when present, is the so called "filling defect."

"I think it is not out of place here to call attention to the necessity of direct palpation during fluoroscopic examination, because frequently the size of the infiltrating and caseating mass of tissue will be entirely out of proportion to that which would be expected in a true neoplasm, with a history as long as many patients give.....

"In my limited experience, I have found that when the filling defects exist neither tubercle bacilli in the stools, nor roentgen ray alone can be depended on for the early diagnosis, and the tuberculin test, except in the primary condition, has the same limitations as the others. If the patient has a primary focus in some other part of the body, its diagnostic value would be negative. Therefore, we are left wholly dependent on the symptoms. These are pain in the abdomen, usually centering around the umbilicus and extending to the left side; weakness in the back; constipation; indigestion with gas; fever; loss of weight; fullness after eating, and diarrhea as a terminal symptom."

Cancer of the Rectum. M. S. Woolf, M. D., Calif. & West. M., 22:613-616, December, 1924.

THE author divides the method of treatment into two parts, palliative and radical. The former is used when the growth has extended widely or the patient is in a very weak condition. The latter method of treatment is used when there is a possibility of recovery from the removal of the entire growth. Operation should only be attempted when there is a good prospect of eradicating the cancer. Colostomy relieves the patient considerably. "Radium therapy may be undertaken in addition; in fact, Kelly and Ward declare that radium, if properly applied, holds out the best hopes for the patients, either with or without radical operation or of itself alone. They report a cure of 11 per cent of two hundred cases one to ten years after treatment, which is much above our or any other average. We can report two cases living three to five years, after local resection in one case, and in the other after abdominal perineal resection."

Heliotherapy in the Treatment of Genito-Urinary Tuberculosis. Nelson A. Myll, M. D., J. A. M. A., 83:1834-1838, November, 1924.

IN the consideration of tuberculosis of the genito-urinary tract, the foundation for the method of treatment is that this condition is a local manifestation of a generalized tuberculosis, and the treatment, to be curative and permanent, must be directed towards the disease rather than to a local manifestation of the disease. In none of the cases seen by Dr. Myll has there been a manifest lesion of the genito-urinary system of the type considered favorable for operation, in which there have not been demonstrable tuberculous lesions in some other part of the tract, and this has been borne out by means of postmortem examinations, in which old fibrous healed lesions of the prostate and seminal vesicle have been demonstrated. It is self evident therefore, that a removal of the epididymis or of a testis, or the draining of a tuberculous prostate cannot, in itself, be curative for the general condition, not to mention the local manifestation.

The method of treatment that has been used by Dr. Myll at the Fitzsimmons Hospital is briefed as follows: Realizing that peace of mind as well as peace of body is essential for the cure of tuberculosis, the patient is first told that the treatment will cover a period of at least two years. He is then put to bed and kept there as a strictly bed patient, with the exception that bath room priviledges are permitted. Heliotherapy is then begun at once, according to the Rollier method. Progressive exposure to the sun's rays is begun at the feet and ankles, gradually increasing the length of exposure and the surface area covered until about two hour's radiation is administered in the summer and three hours radiation in the winter, care being taken at all times that the skin is not burned but tanned. Rest is unreservedly the greatest therapeutic measure in the treatment of tuberculosis but to this is added the regular hospital diet, (regulated according to the individual patient), a routine intravenous injection of five c. c. of a five per cent solution of calcium chlorid

every five days, and a local removal of pus in cases in which the lesion is superficial and easily accessible.

In this hospital there have been fourteen cases treated with heliotherapy; and, according to the author, although the time has been too short to consider this as anything but a preliminary report, the results have so far been uniformly encouraging. In his own words follows the conclusion.

1. Genito-urinary tuberculosis is a local manifestation and that only of a generalized disease.

2. Local treatment, besides being uselessly mutilating, cannot be curative.

3. Surgical procedures give a false sense of security, thus minimizing the important necessity of general hygienic treatment.

4. Heliotherapy arrests the progress of pathologic change and seems to promise a cure of tuberculosis of the genito-urinary tract.

Roentgen Ray Examinations in Diseases of the Kidney. Richard M. Smith, M. D., Am. J. Dis. Child, 28:678-692, December, 1924.

A REPORT of thirteen cases is given. The children presented in these case histories had pyelitis early in infancy, and most of them were found subsequently to have either a stone in the kidney or some congenital kidney defect. They also had recurring attacks of abdominal pain associated with and dependent on pathologic kidneys.

The children with aberrant vessels are perhaps the most interesting because of the fact that aberrant vessels of the kidney are recognized as one of the frequent causes of abdominal pain, intermittent hydronephrosis or recurring attacks of pyelitis in adults. If aberrant vessels are frequent in adults, they must be equally common in children, and yet there is little discussion of such conditions in pediatric literature. The aberrant vessel is usually single, either an artery or a vein, but both may be present, as in one of the patients given in the case histories. It is an extra vessel to the lower pole of the kidney and presses on the anterior surface of the ureter causing obstruction to the flow of urine. As a rule, symptoms do not appear in the first few years of life. This, the author attributes, to the fact that the symptoms do not occur unless the pressure is enough to cause obstruction. This is dependent entirely upon the position of the kidney. If the constriction of the ureter is sufficient, hydronephrosis will result and infection will probably follow. Almost invariably the urine of these children contains abnormal cellular elements, white blood cells in the majority of instances or occasionally red blood cells.

Children who have recurring attacks of pyelitis, or chronic pyelitis if it fails to yield to treatment, especially after the period of infancy, or who have recurring attack of abdominal pain which cannot be explained on some other basis, should have roentgen ray studies made of the kidney.

An accurate diagnosis of such a condition can only be made by cystoscopic, pylelographic and roentgen ray examinations.

The Problem of the Bleeding Uterus. Irving Abell, M. D. Kentucky M. J., 22:513-519, December, 1924.

BLEEDING from the uterus beyond that of the normal menstrual flow occurs with a wide variety of pathological conditions, varying in amount, degree and time of occurrence. It is equally obvious that successful treatment implies thorough and painstaking study of each case until the causative factor is determined; it is reprehensible and at the same time subversive of the patient's interests to prescribe ergot or other drugs until such study and determination of cause has been made. Once the cause has been definitely established, the application of appropriate treatment, medicine, surgery, x ray or radium, alone or in combination may be relied upon to afford relief.

The age of the patient should be one of the determining factors in deciding in favor of radium or extirpation, prefering the latter when the patient is young enough to make worth while the saving of ovarian function.

The dosage of x ray depends upon voltage, filtration, distance and age of the patient; its proper application demands study and experience on the part of the operator. The difficulty of accurately determining the dose that will control bleeding and not produce the menopause, is such that in nonmalignant lesions its use should be restricted to patients of 40 years of age or over.

The dose of radium depends upon the age of the patient, the lesion and the result desired, whether the lessening of the menstrual flow, temporary or complete cessation of the menses. In nonmalignant lesions the younger the patient, the smaller the dose: under 20 years of age, 50 to 100 mgm. hours; 30 to 40 years of age, 300 to 600 mgm. hours for lessening bleeding; for permanent menopause, 1000 to 2000 mgm. hours. In younger patients it is wiser to use the smaller doses and repeat the appli-

cation if necessary rather than inadvertently induce the menopause and its concomitant train of annoying symptoms. In the bleeding due to the malignancy, the toleration of the patient is the limit of the dose.

Uretero-Pyelography In the Differential Diagnosis of the Upper Urinary Tract. JOHN D. LAWSON, M. D., Am. J. Roentgenol., 12:551-554, December, 1924.

IT is the belief of the author that the time will soon come when no diagnosis involving upper urinary tract, other than one of an acute infectious process will be made without the help of the roentgenologist, especially by means of pyelography. The recognition can be brought about by bearing in mind just what help the physician expects, especially along the line of differential diagnosis, and by taking care that roentgenographic reports cover the points in which the clinician is interested.

Radium in Lesions of the Female Urethra. LAWRENCE A. POMEROY, M. D., and FRANK W. MILWARD, M. D., Am. J. Roentgenol., 12: 524-525, December, 1924.

TWO lesions of the female urethra in which radium treatment seems to be the method of choice are urethral caruncle and primary carcinoma of the urethra. The first lesion, urethral caruncle, is common; while the second lesion, primary carcinoma of the urethra, is very rare.

There are certain pathological conditions from which these conditions must be distinguished. A urethral caruncle may give rise to no symptoms, it may cause itching and burning, or it may give rise to intense pain on urination. Ofttimes a urethral caruncle is present unknown to the patient, and may be found only during a routine examination. A true caruncle is a definite benign, extremely vascular, new growth, which may be sessile or pedunculated, springing from a portion of the circumference of the meatus. In contradistinction to caruncle, prolapse of the urethral mucosa practically surrounds the meatus.

The method of treatment used by the authors for urethral caruncle is as follows:

1. Nitrous oxide anaesthetia is used because of the exquisite local tenderness and to permit a thorough plevic examination.

2. Excision of a small portion of the growth is done for microscopic examination.

3. Application of the electrocautery to the bleeding spot left by the excision of this small piece follows.

4. Screened radium is applied to the urethral canal, 50 mg. of radium element screened with 0.5 mm. silver, 1 mm. brass, and 1 mm. rubber, and the insertion of enough 5 mg. steel needles to occupy the growth and usually to surround the urethral canal.

5. The radium is allowed to remain in position from three to six hours, one treatment usually being sufficient.

Primary carcinoma of the female urethra is a rare disease. Treatment of these urethral carcinomata is not satisfactory unless they can be diagnosed early. In certain of these early cases excision may be performed. In the far advanced cases it is the opinion of the authors that radium affords the best method of treatment of the local growth although palliation is all that can be hoped for in many cases.

Tumors of the Breast: A Clinical Consideration. JOHN F. ERDMANN, M. D., Am. J. M. Sc., 168:799-807, December, 1924.

THE author emphasizes the following points:

1. That no tumor of the breast is a desirable tenant, even if its innocence be proven without a shadow of a doubt.

2. That a growth in the remaining breast is as likely to be of primary origin as was that in the breast first removed.

3. That at the present day it is impossible to say positively what the influence of the roentgen ray and radium is, either as a preoperative or postoperative aid. But in view of many apparent reductions in size, previous to operation in cases considered nonoperable, the use of the roentgen ray and radium should be used until proven a menace. In the opinion of the author, too few years have passed for positive results to be shown even in view of some of the glowing reports at present regarding the nonrecurrence. Postoperative treatment should not be neglected by preoperative treatment until some definite proof of its help or inefficiency has been established.

4. That in the presence of late metastases, the powerful currents of the present day should be given a thorough test to prove or disprove the efficiency of this method of treatment.

5. That the most thorough and painstaking wide removal with remote glandular and fascial dissections will tend more and more to increase our percentage of cures and extension of life. That the radical operation is attended with so low a mortality as to promote a greater desire on the part of the consulting physician to demand early operation.

The End Results of the Treatment of Carcinoma of the Breast With Surgery, Radium

and Roentgen Rays. Henry Schmitz, M. D., Am. J. Roentgenol., 12:531-536, December, 1924.

IT is the view of the author that carcinomata of the breast must be grouped to determine the proper method of treatment and to evaluate the efficacy of the various methods of treatment.

The methods of treatment indicated in each group are given their curative value as shown in the three and five year results.

The precentage of the curability of the three and five year end results do not differ materially. This conforms to the observations made that patients with carcinoma of the breast succumb almost invariably to a recurrence during the first three years following the treatment.

The statistics indicate the superiority of the combined method of surgery, radium and roentgen rays over the purely surgical and radiological methods of treatment.

Radium Treatment of Tonsils. C. Augustus Simpson, M. D., Am. J. Roentgenol., 12:527-530, December, 1924.

IN considering the indications for roentgen and radium treatment of tonsils, the opinion of the author is that an enlarged or infected tonsil is, in a majority of instances, a surgical condition especially in children. A hypertrophied and infected tonsil, on the other hand, is not necessarily or unequivically a surgical condition.

It has been in the past the custom of the author to apply radium needles and metal covered radium plaques to the surface of the tonsil; but both procedures are now considered unsatisfactory.

The plaque now used by the author and made especially for this work, contains less than 30 mg. radium, spread over a surface of two square centimeters. It is oval in shape with rounded edges, without corners and the window is covered with a rubber composition that filters out less than two per cent of beta rays. The advantage that this applicator has over needles and metal capsules is due to the fact that more beta rays than gamma rays reach the tonsil.

In preparation for the radium plaques, swab the tonsil with a two per cent cocaine solution, attach the plaque to a compass against the surface of the tonsil, and here it stays in position without the patients help for thirty-minutes for each tonsil. The oval shape allows the plaque to fit snugly between the pillars. A dental suction tube is used to carry off the saliva. With this technique, a mild mucous membrane reaction is reported on each tonsil.

As in the preparation for the use of radium plaques, each tonsil is painted with a two per cent cocaine solution as the patient gags. For buried tonsils, the traction of the anterior pillar with a flat, blunt instrument, gives one an idea of how much lymphoid tissue is to be destroyed. The average size tonsil can easily hold two seeds. Extreme care should be exercised not to have either seed nearer a pillar than 0.5 cm. and the same distance should separate each of the two four seeds. Should the tonsil be unusually large and protruding, three or four seeds, one-fourth millicurie, can be used with entire safety and with assurance that the reaction will not be too severe.

A curved-tipped trochar is used to insert the seeds. It is important to withdraw the trochar before the stylet pushes home the seed in order to retain the seed in position.

Repeating a treatment too soon is as harmful as having the seeds too strong or depositing one in a pillar, and has all the disadvantages of a careless roentgen ray technique.

The number of treatments necessary varies with the condition of each individual tonsil under treatment.

A Review of the Literature on Whooping Cough for the Last Five Years, From 1919 to 1924. Lawrence W. Smith, M. D., Am. J. Dis. Children, 28:597-617, November, 1924.

A complete resume of the subject is given, the articles on treatment being divided into five main groups. Applied physiotherapy, using diathermy, the ultraviolet light and the roentgen ray, constitutes one group.

In the application of diathermy, two thin lead electrodes covered with flannel soaked in saline solution were used. The strength of the current varied from three to five amperes, depending on the age of the patient. This was administered from five to fifteen minutes twice a day. Results were reported following ten or twelve treatments. Radiation of the pharynx by concentrated light was reported to have decreased attacks both in number and in severity. An exposure of from ten to twenty seconds was given, repeated several times in succession, twice a day. Ultraviolet rays, used in the treatment of the disease, were administered to the chest for five minutes, and after five days a second exposure was made, regulated according to the skin reaction, increasing the duration by from three to five minutes, alternating front and back. With roentgen rays, the method of treatment was to expose the chest first anteriorly and then posteriorly for three times on alternate days, using a

6 inch back up spark, a 1 mm. aluminum filter and the tube placed at a distance of 24 inches from the patient. The dosage ranged from 8 to 20 milliampere minutes.

In the opinion of the author after reviewing the literature on the subject of the various forms, "physiotherapy seems to offer more than the other methods of treatment. Perhaps the ideal treatment of the present time may be that suggested by McKibben.....in which he states that the combination of the roentgen ray and adequate doses of vaccine give the most beneficial effects. The disease is one which still remains to be solved by further experimental work."

Some Observations of the Use of the X Ray in the Treatment of Pertussis. Morgan Smith, M. D., and A. C. Kirby, M. D., J. of Arkansas M. S., 21:143-146, December, 1924.

WITH the mortality rate ranging from 60 to 70 per cent in infants under three months, 25 per cent during the first year, and seven per cent from two to five years, it will be generally agreed with the authors that one is justified in grasping at every logical therapeutic or other measure that might prove beneficial in the treatment of this disease.

A series of five cases are presented, although the results given are from judgments made on twenty cases that have received roentgen ray treatment, the youngest being four years of age and the oldest seven years of age.

The radiologists cordially cooperated with them and not the slightest casualty occurred to prejudice parents against the treatment. The total dosage used never exceeded one-half the erythema dose and consisted of five minutes, distance 14 inches, spark gap 7½ inches, filter ¼ mm. copper and 4 mm. aluminum. In the first cases, exposure of from three to five minutes was made over the anterior chest and lower neck. Three or four days later exposure was made over the back of the chest. Later radiation was ordered over both the anterior chest and the back at one sitting. The area over the thyroid and thymus was protected with a lead screen. Alternate radiation of the chest and back at three or four day intervals is now used. There seems to be no difference from either method.

During these exposures a careful examination was made in each case, and the incidence of certain symptoms noted, namely, number of paroxysms of cough in twenty-four hours, whooping, vomiting, cyanosis and dyspnoea. Estimation of results was made upon the statements of the mother or nurse, but in consideration of the types of cases handled there was no allowance to make for imagination.

The authors draw no conclusions because of the small number of cases treated, but it would appear that the roentgen ray offers a new hope in the treatment of pertussis. It is advised to begin treatment early, alternate radiation over the chest and back at three and five day intervals for three treatments and reradiate later if necessary.

New Methods for Making Esophageal Strictures Visible and Photographing Them; Particularly in the Case of Children. Arthur Pollerman, M. D., Am. J. Dis. Children, 28:549-552, November, 1924.

ORDINARILY, the wall of the esophagus is easily penetrated by the roentgen ray, so that no shadows are cast unless the common mixture of bismuth and barium compounds are ingested. With children such an application is practically impossible. The author devised rubber tubes of various sizes, made of thin walls and impregnated with as much lead as the rubber could carry without losing its elasticity. After inserting one of these tubes, the distal end of which is sealed, it is inflated with air so that it closely adheres to the wall of the esophagus and, owing to the contained lead, permits the observation of the esophageal walls and of any strictures or other deformities that may be present.

When the tube cannot be used an administration of another suspension is used to supplant the bismuth impulsion. This suspension of bismuth subcarbonate contains oil of bitter almonds, eight parts; gum arabic, four parts, and water, eight parts. This mixture is superior to the common bismuth and barium suspensions, since it is not so easily displaced by the peristaltic waves.

The Diagnosis of Dilatation of the Bronchi in Children by Means of the Injection of Iodinized Oil. P. Armand-Dleille, M. D., C. F. Gelston, M. D., Am. J. Dis. Children, 28: 527-548, November, 1924.

THE contrast between other radiographic reproductions and those obtained by means of the injection of iodinized oil offers extremely valuable information.

1. If there is the picture of multiple shadows in the neighborhood of the hilum with an excessive bronchial ramification, the shadows being joined to the bronchi by a pedicle, the diagnosis of bronchial dilatation is justifiable. It may be demonstrated later, perhaps, that this conclusion must be modified in cases of

glandular cavities, but until the present no such cases have been encountered.

2. If the shadows are confluent but can, nevertheless, be separated by careful examination, the diagnosis of dilatation of the bronchi is again established.

3. If the larger bronchial ramifications, without showing bunched localized shadows, appear noticeably enlarged one must admit a cylindrical dilatation of the bronchi.

4. If there is a question of shadows along the smaller bronchial ramifications, when they are compared to the normal picture, one may establish the presence of a moderate degree of bronchiectasis.

Tuberculous cavities are disregarded, since they are easily recognized by ordinary roentgenograms. Cavities resulting from pulmonary abscesses are usually located far from the hilum and the mediastinum, above the diaphragm, and are usually single.

Aside from the great diagnostic interest presented by this method of intratracheal injections of iodinized oil in children, emphasis was placed on the fact that it is entirely innocuous and further holds out the hope of perhaps having a therapeutic application of some considerable value; in fact, it has been observed in a number of young patients a marked lessening in cough and expectoration, together with modification of physical signs indicating a diminution in the size of the bronchial cavities. It would appear that there might be a local effect of the iodin; but this has not been checked by means of second injections.

From all standpoints, it seems that this method, having already been proved efficient and of no danger, promises to furnish valuable and important information regarding the normal and pathological appearance of the bronchial tree in children.

Survey of Nontubercular Chest Lesions. Henry Snure, M. D., Calif. & West. M., 22:616-617, December, 1924.

IN considering "nontubercular" lesions of the lung, the author includes the following nontuberculous conditions: influenza and pertussis bacilli; pyogenic bacteria, such as staphlococci and streptococci; pneumococci; anaerobic bacteria; lues; actinomycosis and echinococcus.

The most common of these conditions to be confused with tuberculosis is the so-called indurative pneumonia, the clinical conditions being very similar, but the x ray distinguished by an involvement in the lower lobes. Tuberculosis involves the lower lobes in less than 10 per cent of the tuberculous cases.

On the other hand, Wessler and Jackes, in classifying lung abscesses according to the cause, find 21 per cent due to aspiration following tonsillectomy, and in the nonaspiration cases, 21 per cent due to chronic pneumonia, and 21 per cent due to the so-called flu. These three conditions accounted for 63 per cent of the cases; the remaining 37 per cent were caused by some 13 different diseases. They also state that out of 100 consecutive cases of lung abscess where postmortem examinations were made, only 12 were diagnosed clinically, and 50 by x ray examination. In other words, four times as many pathological conditions of the lung, nontuberculous in character, were picked up by the radiologist with the use of the x ray.

Results of Radiation Therapy in Leukemia and Lymphogranuloma. B. F. Schreiner and Walter L. Mattick, J. Cancer Research, 8:504-514, December, 1924.

THE etiologic agents in leukemia and Hodgkin's granuloma are at present unknown. Due to their close resemblance to tumor processes and their common tendency to involve the lymphatic system, these two diseases have been classified together.

The results of the radiation therapy in these two conditions are reported in 25 cases of leukemia and 46 cases of lymphogranuloma.

Radiation therapy is empirical, like the medical treatment of these diseases, but tends to induce remissions with the least possible inconvenience to the patient. Medical therapy, on the other hand, should be used wherever indicated in conjunction with radiation therapy. Radiation therapy was given in two acute cases with temporary improvement. An optimal dosage is still desired for both diseases.

In the mind of the author, no cures of leukemias or Hodgkin's disease by this form of therapy, but marvelous amelioration of symptoms and remissions, have resulted which, however, were not permanent.

Air and Lipidol as Contrast Agents for Roentgen Diagnosis Within the Central Nervous System. H. C. Jacobaeus and Folke Nord, Acta Radiol., 3:367-382, 1924.

THE writers report three cases of cystic brain tumors. In the first case, the contents of the cyst have been excavated by puncturing, and have been replaced by air, by means of which the exact localization becomes more apparent at the roentgen examination than by other methods. In the second case, a puncture has also been made, but the cyst

cavities are all filled with lipiodol, which was found to give still more exact and finer pictures at the roentgen examination. In the third case, lipiodol and air have first been injected into the ventricles and then into the cystic tumor. The lipiodol injected into the ventricles did not supply any information as to any pathological changes or deformities within the ventricles. With regard to the cystic tumor, which in this case consisted of large chambers, both methods of examination have given pictures that, from a practical point of view, are about equally distinct.

Dilatation of the Diploic Veins and Other Anatomical Variations in the Skull. Leon T. LeWald, M. D., Am. J. Roentgenol., 12:536-541, December, 1924.

THE general impression of the roentgenologists and neurology surgeons as to the importance of prominent diploic veins would be difficult to explain the relative frequency of prominent or dilated diploic veins in individuals who are not suffering from any demonstrable intracranial lesion.

With improved technique and with the aid of the Bucky diaphragm, the author was able to demonstrate the so called dilated diploic veins in many apparently healthy individuals. These veins were observed in only one portion of the skull, on one side or on both sides. The pattern not only varied with the individual, but also varied on the two sides of the same individual. In the opinion of the author the term "dilated diploic veins" should be abolished, substituting some anatomical term in its stead, such as "prominent diploic venous channels." The condition has been observed in healthy children at the age of ten years.

Prominent convolutional markings on the skull were present in apparently healthy individuals.

Apparently healthy individuals also showed marked irregularities in the inner table of the skull; extensive depressions for the Pacchionian bodies; prominent suture lines and deep grooves for the meningeal arteries.

Calcium deposits in the pineal gland were demonstrated in healthy individuals in early adult life.

Cessation of Diabetes Insipidus on Roentgen Ray Treatment of Pituitary Gland. E. B. Towne, M. D., J. A. M. A., 83:2085-2087, December 27, 1924.

THE author presents a complete case history of a patient who suffered from diabetes insipidus, associated with one definite sign of a lesion in the vicinity of the optic chiasm—a defect in the upper temporal quadrant of the right visual field. Syphilis, tuberculosis and fracture of the skull appeared to be eliminated as possible causative factors. Measurements of the sella showed it to be in the upper limits of normal. A diagnosis of pituitary tumor was made, and the patient was treated by roentgen ray crossfire to the pituitary region, in hope of causing recession of the tumor. Three months later the visual fields had returned to normal and had remained so. The urinary output dropped from about 8 liters to about 3.5 liters in the first three months; there was a recurrence at the fifth month, which again appeared to respond to the roentgen ray; and there was another recurrence and similar, though slower, response beginning in the eighth month. Seventeen months after treatment was started the output dropped to 2.5 liters, and it has remained at about that point until the present time, over three years after the patient came under observation. Very striking improvements and relapses in the physical and mental condition of the patient coincided with the drops and rises of the urinary output. The net result, clinically, is that a totally incapacitated man has become an efficient wage earner.

In the light of these results the author asks if it is correct to conclude that the diabetes insipidus in this case was caused by a tumor in the region of the optic chiasm, and cured by roentgen ray treatment of the tumor? No other treatment of any kind was given to this patient. The unexplainable cures of this disease, following spinal puncture and the administration of various drugs, urge caution in interpreting the disappearance of the polyuria. But the diagnosis and method of treatment seem theoretically sound and the response of both recurrences to further treatment was very striking. Moreover, the confirmatory evidence of disappearance of a quadrant defect in the visual fields following the first roentgen ray series is most important, for this defect was certainly caused by a lesion in the neighborhood of the optic chiasm, and it is known that the field defects sometimes improve or disappear following roentgen ray treatment of pituitary tumors.

It seems proper to conclude, therefore, that in this case the evidence suggests a cure of diabetes insipidus as a result of recession of a pituitary tumor under roentgen ray treatment.

Studies on the Effect of Roentgen Rays on Glandular Activity. A. C. Ivy, Ph. D., M. D., J. E. McCarthy, M. S., and B. H. Orn-

DOFF, M. D., J. A. M. A., 83:1977-1984, Dec. 20, 1924.

THE conclusions offered by the authors are as follows:

1. Exposure of the thorax of Pawlow pouch dogs to the roentgen rays sufficient to cause a first degree burn has no effect on gastric secretion and causes no symptoms.

2. A similar dose delivered over the lower abdomen causes a temporary anacidity or hyponormal secretion associated with anorexia, followed by a return to normal of gastric secretion and appetite, with a progressive loss of weight and cachexia. Necropsy shows chronic ulcers of the intestine.

3. A human erythema dose of roentgen rays of short wave length delivered over the abdomen causes a hypernormal secretion of gastric juice lasting one or two days, followed by anorexia, hyponormal secretion and sometimes diarrhea, followed on the fifth day by normal gastric secretion and appetite. This dose causes death in from six to fourteen days in dogs that are not in perfect condition.

4. Seventy-five per cent of a human erythema dose—the usual "unit dose" used in the therapy of malignant tumors—caused mild acute symptoms of intoxication associated with anorexia, anacidity and hyposecretion.

5. The observations of others on the sensitiveness of the intestinal mucosa to roentgen rays are confirmed, the intestinal mucosa being at least twice as sensitive as the fundal mucosa of the stomach.

6. Our findings do not warrant the use of roentgen rays for treatment of conditions in which it is desirable to reduce gastric acidity.

The Roentgen Ray Treatment of Hyperthyroidism—Report of One Hundred and Fourteen Cases. THOMAS A. GREVER, M. D.; ARTHUR C. CHRISTIE, M. D., and EDWIN A. MERRITT, M. D., J. A. M. A., 83:1757-1761, November 29, 1924.

THE conclusions offered by the authors state that:

1. A study of the results of the roentgen ray treatment of hyperthyroidism in individual cases and by means of the incomplete statistics so far available, indicates that this method will probably furnish about the same percentage of permanent cures of exophthalmic goiter as surgical treatment in the best hands.

2. The roentgen ray method has the following advantages: (a) There is no mortality resulting from the treatment; (b) patients will submit to this method of treatment at a much earlier stage of the disease than to operation; (c) the method is applicable to inoperable and to postoperative cases.

3. Patients with hyperthyroidism should first receive roentgen ray treatment, and be operated on only if the disease fails to respond to this treatment. This would not apply to patients with toxic adenoma with mild hyperthyroidism who have no vascular or other diseases which render them inoperable. The operative mortality in this class of cases is very low, and surgery has the great advantage of removing the tumor. Our general impression is that roentgen ray treatment is not so useful in toxic adenoma as in exophthalmic goiter, but that it may be of great advantage in rendering very toxic cases operable and in the treatment of cases that are inoperable for reasons other than hyperthyroidism.

The Management of Exophthalmic Goiter. J. MARION READ, M. D., J. A. M. A., 83:1963-1968, December 20, 1924.

EXOPHTHALMIC goiter is a disease of unknown etiology, which runs a natural course of long duration which it is difficult to shorten very appreciably by any known means. The aim of all therapy should be to carry the patient through its course with the maximum of comfort to the patient and as little permanent damage as possible. It must not be forgotten that the most serious of sequalae is myocardial insufficiency, which may develop in untreated severe cases, but is not encountered as frequently as formerly believed. The rest, reduction of toxicity, and cardiac support are all aimed at avoidance of this distressing aftermath. The judicious administration of iodin may, in many cases, prove as efficient as any other means of reducing toxicity and slowing the pulse rate. In addition to the time element, which is most important single factor in effecting a cure, the most effective measures are, in order of their importance:

1. Rest, both physical and mental;
2. Roentgen ray;
3. Iodin;
4. Symptomatic therapy, of which quinine hydrobromide is very effective; and
5. Surgical intervention in a very few cases, the type varying with conditions.

The view of the author on the value of roentgen ray irradiation is to the effect that this method of treatment should be tried in most cases of exophthalmic goiter, as it seems to reduce the toxicity, and in skilled hands is without danger. The same skill should be required by the roentgenologist who undertakes to treat these patients as is required of the surgeon. In the roentgen ray treatment the mortality is nil;

at least it is not increased over the irreducible minimum, and no myxedemas, burns or scars are produced with the present technique employed by trained roentgenologists. The period of treatment varies with the severity of the disease and should be presisted in from four to six months, with monthly estimation of the basal metabolic rate. This form of treatment will not prevent recrudescence any more effectively than does surgery, but it has the added advantage that the patient is still under supervision and realizes that treatment must be presisted in until he is sufficiently recovered to require medical attention no longer.

In the opinion of the author, to draw distinctions between medical, surgical and radiologic treatment is merely splitting hairs. Premature classification of a disease as a medical, or surgical condition before its etiology is discovered will lead to dissatisfaction in the minds of both patient, and physician, especially the former. Both surgery and radiology are therapeutic weapons which the internist may employ as occasion arises. Individualism is the key to successful treatment.

X Ray Treatment of Toxic Goiter. J. H. Bridenbaugh, M. D., Northwest M., 23:550-552, December, 1924.

ALL thyroid diseases are divided into two general classes, nontoxic or toxic. The nontoxic cases are not an x ray problem. The toxic cases, on the other hand, are subdivided into simple hyperthyroidism and exophthalmic goiter. Simple hyperthyroidism is often associated with adenomatous changes, the symptoms being due to an increased quantity of thyroxin. Exophthalmic goiter is accompanied by general hyperplasia of the gland and, according to the author, an alternation in the character of the thyroxin is produced.

The action of the x rays on glandular tissue is well known. Large doses applied over the salivary glands result in dryness of the mouth. "Knowing that the symptoms of hyperthyroidism are due to an abnormal activity of the thyroid gland, and that the x rays have a powerful depressant activity on glandular activity, we have a very rational and scientific basis for the use of radiation in the treatment of this condition."

The treatment and technique presented by the author is as follows: A 9 inch spark gap, 5 ma. of current, 8 inches target skin distance, 6 mm. filter of aluminum and leather, and about ¾ of an erythema dose is given over 4 areas, treating right and left lobes thymus and an additional exposure from the back. The vocal cords are protected with a small piece of lead, or hoarseness and even loss of speech may result. Improvement is usually not evident until after four to six weeks have elapsed.

The conclusions of the writer point towards the facts that:

1. X ray is an efficient means of controlling hyperthyroidism.
2. The results are at least as certain and permanent as those obtained by other methods.
3. There is no pain, no scar, and no mortality connected with this treatment.

Radium in Ophthalmology: With Reference to its Use in Benign Affections. Laura A. Lane, M. D., J. A. M. A., 83:1838-1845, November 23, 1924.

1. Radium is of distinct value in treating many benign affections of the eye.
2. It is a specific in vernal conjunctivitis, trachoma and certain lid lesions.
3. Radium gives promise of being a valuable aid in the treatment of ulcers and opacities of the cornea, and probably in some affections of the deeper eye structures.
4. A better knowledge of dosage, screening and methods of application of radium in order to obtain maximum results, together with more uniform methods of reporting cases, is highly desirable.
5. Radium offers less scarring, greater freedom from pain, less loss of time from work, and more sightly results than surgery in many diseases about the eyes and head.
6. Every unnecessary operation does some harm to medical science.
7. Attention must be paid to the physical condition of patients undergoing radium therapy.

Vernal Conjunctivitis. Maximilian J. Hubeny, M. D., Radiol. Review, 1:50-52, November and December, 1924.

THE technique advocated by the author consists of the following factors: 9½ S. G., 9 inch S. F., 4 mm. of aluminum, 5 milliamperes of current for 6 minutes. This is equivalent to about two-thirds erythema dose. Four to six exposures are given at three week intervals. Each eye is treated separately at one sitting, properly shielding the neighboring areas, first, to prevent an unexpected loss of eye lashes and eye brows, and second, to maintain a safe biological policy of not molesting or disturbing adjacent healthy tissues unnecessarily.

Malignant Neoplasms of the Bones. W. F. Smith, M. S., M. D., F. A. C. S., J of Arkansas M. S., 21:135-142, December, 1924.

SINCE the bone neoplasms do not run true to form, the diagnosis of a bone tumor probably presents as many difficulties as any other single pathological lesion. Since there are no biologic or serologic tests and no pathognomonic symptoms of bone neoplasia, a broader and more accurate field of information must be resorted to which embraces the essentials of (1) clinical data, (2) x ray examination, (3) an exploratory operation with macroscopic and microscopic examination of the material removed at the time of the operation.

The x ray examination may reveal various pictures. The x ray picture of the central sarcoma of the long bones shows an irregular destruction with little or no new bone formation until the periosteum is involved or broken through. The x ray showing of periostcal sarcoma is more destructive. There is frequently new bone formation presenting the new bone laid down in striae perpendicular to the shaft. The deposit of new bone is entirely in the soft tissues and does not reach the bone proper.

Early amputation, deep x ray and radium seem to offer an occasional arrest in the development of these cases. The permanent cures by x ray and radium seem largely to be in the group of new growths in which satisfactory results have been obtained by curetting, by destruction by chemicals, by cauterization, or by the intense cold of liquid air.

THERAPY

LONG CURE

SHORT CURE

Treatment of Rickets With Quartz Lamp After Sensitizing With Eosin. Dr. Kate Pilling, Deusche. med. Wochenschr, 47:1608-1609, 1924.

THERAPY

QUARTZ lamp has become most valuable in rickets. Experiments by Tappeiner, Jodlbauer and others on plants and infusoria showed that fluorescing dyes by their katalytic action raise the sensibility of the radiated material and brings about a stronger photochemical reaction.

The author administered eosin per orem dissolving 0.1 gm. of the crystals in 10 cc. of water and divided in three doses. The infants took it well. Very few vomited on account of the ill taste. Gyorgy and Gottlieb administer it with pulverized milk. Three hours after administration, the stools and urine are strongly red, the saliva is also red for many hours.

In the author's clinic the following schedule for radiation is used:

LONG CURE

Last four weeks. Radiation time 100 minutes two times weekly, lamp-skin distance 70 cm.

First week.....2 radiations 5 minutes each
Second week....2 radiations 10 minutes each
Third week.....2 radiations 15 minutes each
Fourth week....2 radiations 20 minutes each

SHORT CURE

Lasts 14 days, 12 radiations of 100 minutes, lamp distance 70 cm.

	Minutes		Minutes
First day	1	Eighth day	9
Second day	1	Ninth day	10
Third day	2	Tenth day	12
Fourth day	none	Eleventh day	none
Fifth day	3	Twelfth day	15
Sixth day	5	Thirteenth day	15
Seventh day	2	Fourteenth day	20

The day before radiation 0.1 gm. eosin solution was administered.

The author enumerates the results as observed by improvements of the various symptoms, such as craniotabes, kyphoscoliosis, beaded ribs, weak and flabby musculature, pallor of skin and late dentition. The sensitizing by means of eosin cut the duration of treatment from six to two weeks. No untoward results from the use of eosin was noted.

A. M. Pfeffer, M. D.

Antirachitic Properties Imparted to Inert Fluids by Ultraviolet Irradiation. Alfred F. Hess, M. D., and Mildred Weinstock, M. D., J. A. M. A., 83:1845-1846, November, 23, 1924.

INVESTIGATIONS were carried out under the supervision of the authors to determine whether by means of irradiation, inert substances could be endowed with antirachitic potency. With this end in view, various fluids were irradiated with the mercury vapor quartz lamp. To summarize the results of these experiments, it may be stated that it was found that cottonseed oil, when radiated for an hour at a distance of one foot, had acquired antirachitic properties. The experiments were carried out as follows: A very thin layer of oil was placed in a Petri dish and radiated. It was then fed to young rats in amounts of 0.1 c.c. daily. The control animals received oil that had not been radiated. The rickets producing diet was the low phosphorous dietary that has been used by the authors in the study on experimental rickets during the last few years, and the technique was the same that had been previously used. In order to exclude the possibility that the effect might be due to an antirachitic potency of cottonseed oil, linseed oil was substituted and the experiments carried out in the same way, 0.1 and 0.25 c.c. being

given daily to each rat. The same result was obtained, namely, the development of rickets when nonirradiated oil was fed and the prevention of rickets when the oil was given that had been irradiated.

Water to which radium bromid had been added in small amounts was fed daily but without effect. Failure also resulted when subcutaneous injections of radium water were done.

Assuming that the antirachitic effect might be due to the ozone given off by the mercury lamp, water was ozonated and given to a series of rats. It was found to possess no protective action whatsoever.

In the radiated oil, the iodin number remained unchanged, and a peculiarly fishy odor, similar to that of cod liver oil, was often noted. The nature of the change in the activity of the oil is being investigated at the present time by the authors.

Nonrachitic Softening of the Ribs in Infants and Children. Alfred F. Hess, M. D., 28: 568-573, November, 1924.

SOFTNESS of the ribs and the anterior thoracic wall is not necessarily a sign of rickets, although it may be brought about or intensified by this condition. The treatment of this condition is not the same as that for rickets, cod liver oil or ultraviolet irradiation being ineffective.

Beitrag Zur Kenntnis Der Kongenitalen Form Der Coxa Vara. Harold Nilsonne, M. D., Acta Radiologica., 3:383-406, October 11, 1924.

THE following summary characteristizes the article:

The writer gives a short historical review and reports upon five cases of congenital coxa vara from the orthopedic department of the Royal Caroline Institute, of which three are unilateral, one bilateral, and one a case of an apparent defect of the femur which was found after a few years to have developed into an extreme coxa vara. In addition the author describes two cases from the Anna-Stift in Hanover of which one was unilateral and one case was an apparent defect of the femur which developed into an extreme coxa vara.

Congenital coxa vara are those cases of nonrachitic and nontraumatic coxa vara which manifest themselves in the earliest infancy, and which, in the roentgenogram, presents certain characteristic features common to them all, indicating an early anomaly of ossification in the head and neck of the femur. This anomaly is a disturbance of the ossification, possibly due to an embryonic vascular disorder, which gives rise to a coxa vara either during intrauterine life or when late bearing is commenced.

Clinically the congenital form of coxa vara does not differ from its other forms, excepting the cases that present a high grade shortening of the femur. The vertical epiphyseal disc is not pathognomic of congenital coxa vara, but an irregular epiphyseal disc with rough contours is, on the other hand, of diagnostic value. The picture of incomplete ossification, the presence of a zone of rarefication, and the occurrence of several osseus nuclei in the neck of the femur, are distinguishing characteristics most important in the diagnosis.

The therapy does not differ from that usually employed in coxa vara. In cases in which the coxa vara is not too extreme attempt should be made to effect a cure by means of the abduction method in the plaster of paris splint, which should be done with caution, on account of the disturbance of ossification in the neck of the femur. To get any result in extreme cases, it is necessary to perform osteotomy.

L'Image Radiologique Non Encore Decrite D'Une Anomalie Du Squelette. N. Voorhoeve, M. D., Acta Radiologica., 3:407-427, October 11, 1924.

OSTEOPOECILIA or osteopathia condensans disseminata and the cases described are two manifestations or phases of one and the same process. Both of them should be classed among the dyschondroplasia group. A description of the roentgenological picture is described in the article.

Synovectomy of the Knee Joint. J. S. Speed, M. D., J. A. M. A., 83:1814-1817, November 23, 1924.

FOLLOWING synovectomy of the knee joint, active motion should be administered at the earliest time possible, often the second or third day after operation. The knee is suspended and active motion is aided by pulleys under the control of the patient. Flexion contractures can be prevented in this way. To aid this freedom of movement, physiotherapy, consisting of light baking and massage, about the seventh or tenth day aids in the absorption of the exudate and promotes an early return to function.

Splinting and Physiotherapy in Infections of the Hand. Allen B. Kanavel, M. D., J. A. M. A., 83:1984-1988, December 20, 1924.

STATEMENTS made by such a reputable authoritative on infections of the hand as

Dr. Kanavel are taken as proven facts.

In the treatment of infections of the hand, the mechanical devises used, such as splints, flexion-retaining bar, etc., are so applied that they can be removed for the necessary massage and physiotherapy treatments. The physiotherapy used, consists, in brief, of massage of scar tissue, diathermy, development of muscle function by massage, stimulation with the galvanic and faradic current, and passive and active motions. The use of apparatus, devices, of machines is directed to the same ends, as, for instance, the use of the typewriter, etc., that will stimulate the patient to use the hand in a powerful manner. The splints must be examined frequently to see that the tension is adequate and in the proper direction, that no pressure sores are developing, and that the patient is securing the physiotherapy indicated in each condition.

Radiography in Orthodontia as Related to Impactions. Clinton C. Howard, D. D. S., Internat. J. Orthodontia., 10:815-818, December, 1924.

"THE use of the x ray has become a part of daily routine in the practice of orthodontics. It is an indispensible assistance in establishing the existance of supernumerary teeth, the presence of impacted teeth, the status of congenitally missing teeth, as well as other important information impossible to ascertain by a clinical examination.

"Our speciality, orthodontia, owes much to you (radiologists) as a group of earnest students. Please accept our gratitude for the fruits of your labors which have added so materially to the efficiency of our endeavors."

Erythema as a Unit in Deep Roentgen Therapy Dosimetry. Eugene T. Leddy, M. D., and James L. Weatherwax, M. A., Am. J. Roentgenol., 12:514-518, December, 1924.

ONLY rarely is the complete technique mentioned in results of radiotherapy of neoplasms, the dosimetry being given only as so many per cent of the erythema, or unit skin dose, and little mention is made of the factors by which this dose is obtained. The impression is gained that the standardization of dosage on erytherma gives an absolute basis on which to compare technique and results.

In the literature, are given various different value, although it is true that between some of them there is a close agreement. Some of these units of dosage are calculated in absolute electrical units of ionization current, measurements being made in the centimeter-gram-second system, the value being expressed in (e). But even on this basis, dosimetry is not as absolutely defined as the selection of such an absolute standard might lead one to believe. Most of the measurements are made by iontoquantimetric determinations of roentgen intensity checked against a radium standard, but unless one is in a position to duplicate electrical and ionization systems by which the measurements are made, their value and fixity can not be checked up exactly.

"Seitz and Wintz define a 'unit skin dose' as the quantity of radiation which eight days after exposure produces a slight hyperemia and four weeks after, a slight tanning of the skin.

"Kroenig and Friedrich set their unit differently and define it as a 'first degree erythema' placing the value at 170 (e). Daune and Bachem have both set their erythema value at 1800 (e), using the technique commonly used in deep therapy. According to Bachem, this value produces a mild erythema. At 1500 (e) there is the first indication, in some cases, of reaction; 2100 (e) gives a definite reaction. The erythema value set by Schmitz corresponds with that of Friedrich. Furstenau says that 120 F. are necessary with hard rays to produce an erythema."

Considering this tremendous variation in that which is commonly considered the standard, the author asserts:

1. The erythema (skin unit) dose is a flexible, aribitrary, inaccurate standard.

2. Dosimetry based on it has a relative value individual to the judgment of the radiologist.

3. If used as a basis of comparison of technique, its threshold value is more practical than its intensity.

4. In reporting technique and therapy, full data should be given until a definite standard is established.